

American

FORESTS

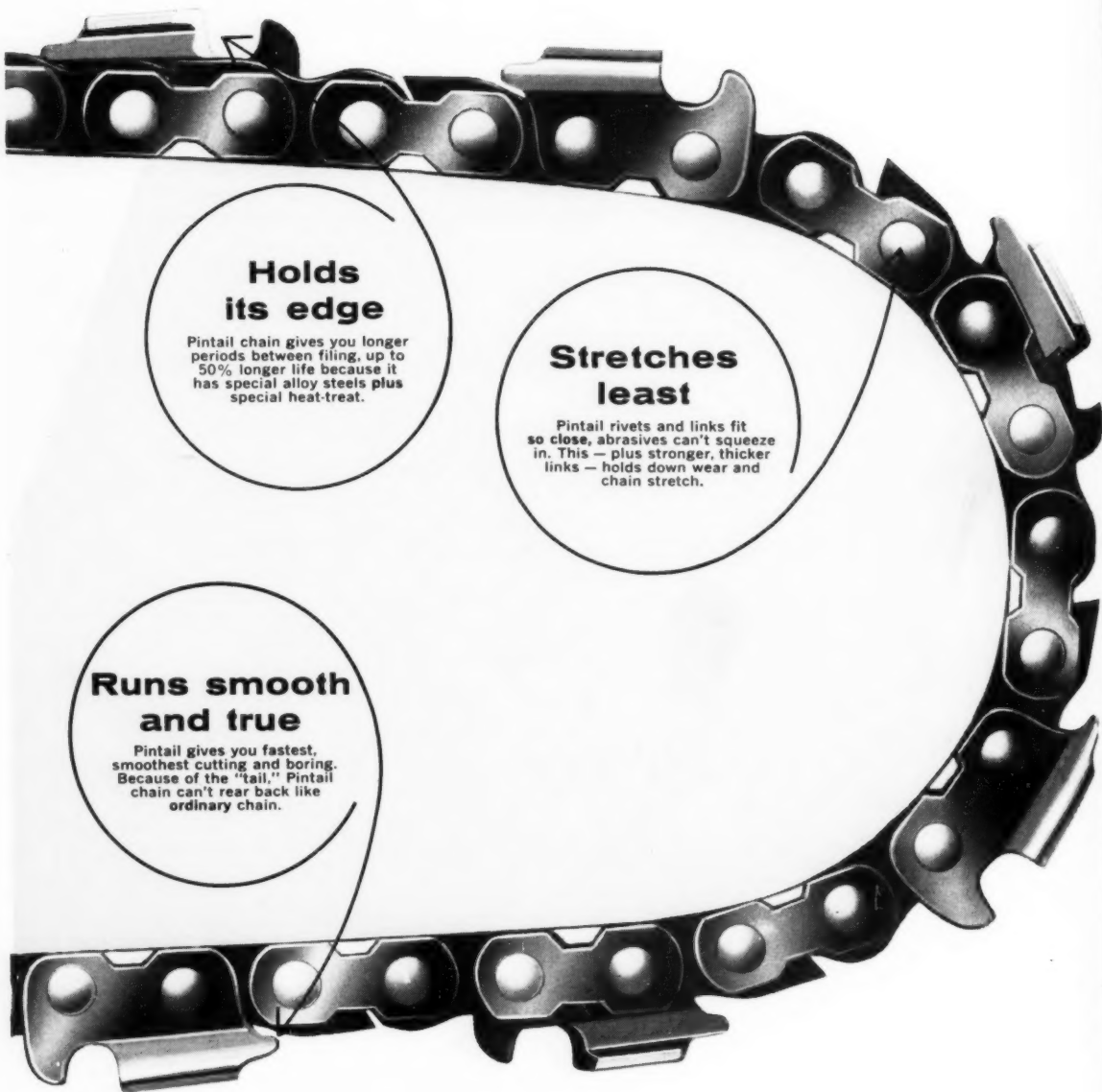
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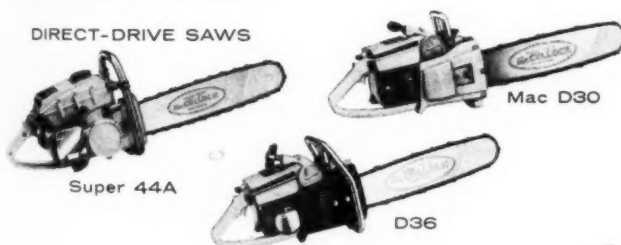
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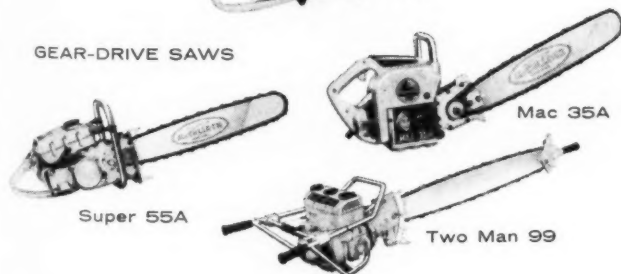
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CHAIN SAWS

PROGRESS ON MINNESOTA LAND STUDY

THE Advisory Committee on The American Forestry Association's study of land ownership in Minnesota held its third meeting in St. Paul on October 3 under the chairmanship of Dr. George A. Selke, the state's commissioner of conservation. Special attention was given to the form and content of the report which will incorporate the findings of the study. A few of the facts and problems that play a prominent part in the picture are as follows:

Minnesota has the largest percentage of commercial forest land in public ownership (56 per cent) of any state in the eastern United States. Its nearest competitors are Michigan and Wisconsin, with 34 per cent and 30 per cent, respectively, in public ownership.

Of the area in public ownership, 20 per cent is owned by the counties, 19 per cent by the state, and 17 per cent by the federal government (including Indian lands). Most of the federal land is in national forests, where nearly three-fifths of the total area has been acquired by purchase. The great bulk of the land in state ownership consists of grants from the federal government to which the state has retained title.

Minnesota is unique in the size of the area in county ownership. This area includes 45 per cent of the entire area of commercial forest land in county ownership in the United States. Practically all of it was once in private ownership and has been acquired by the counties by tax forfeiture.

Industrial ownership is relatively very small. It includes only 3 per cent of the commercial forest area, as against 41 per cent in the hands of other private owners, two-thirds of whom are farmers.

The "small woodlot problem" looms large. Owners of forest tracts of less than 100 acres comprise 88 per cent of the total number of private owners and hold 53 per cent of the area in private ownership. Corresponding figures for owners of 5,000 acres or more are 0.25 per cent and 9 per cent.

The pattern of land ownership, particularly in the northern counties, is decidedly "scrambled." Within the boundaries of the Chippewa National Forest are parts or all of

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American FORESTS

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COVER • AFA Board Member Karl T. Frederick (left), who is a trustee of the Theodore Roosevelt Association, presented a copy of the Laszlo portrait of Theodore Roosevelt (see editorial, page 11) on behalf of the association to AFA President Don P. Johnston (right). Cover and all photographs of the annual meeting in this issue by Mickey Prim, Manley Studio, Tucson.



The AFA

The American Forestry Association, publishers of *American Forests*, is a national organization — independent and non-political in character — for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and the part they play in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

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Forest Forum

Color Made a Hit

EDITOR:

Your last issue is just marvelous with those gorgeous colored pictures of Arizona. . .

Ethel L. Larsen
Langeland
Manistee, Michigan

EDITOR:

Congratulations on the beautiful colored plates in the October issue. Do continue this feature, it will add tremendously to the interest of the articles.

Mrs. Herbert Brown
107 West Moreland Avenue
Philadelphia, Penna.

EDITOR:

Your fine Arizona color photos in the October *American Forests* are much appreciated. They should have something to show the definite location of the photographer for each picture.

Belknap C. Goldsmith
Los Gatos, California

EDITOR:

. . . The color pages were most welcome . . .

Mrs. Helen K. Bizok
216 W. Cross Street
Masontown, Penna.

EDITOR:

The article on Tucson with its beautiful illustrations in the October issue has given me so much pleasure and profit that I would like to add my name to what is no doubt a long list of members who hope that this feature will become a regular one.

Helen G. Thomas
67 Whittier Road
Wellesley Hills
Massachusetts

EDITOR:

May we congratulate you on the very fine October 1958 issue of your excellent journal? This issue was exceptionally good . . .

B. Bernarr Vance, Head
Dept. of Biology
Fairview High School
Dayton, Ohio

EDITOR:

Allow me to compliment you on your October issue. I believe every reader sat up and took extra notice of the issue . . . The topics and the photos in this issue will certainly increase the interest in your magazine, especially in high school students.

W. B. Weary, M.D.
3607 Gaston Avenue
Dallas 10, Texas

EDITOR:

. . . The photographer is certainly to be congratulated on the excellent work he has done; the photographs are impressive, and long to be remembered!

Bette Hoover
P. O. Box 120
Denver, Colorado

EDITOR:

The bleed color pages add a new dimension of excitement to *American Forests*. Let us hope we can have more of them.

C. P. Holway
Route One
Evansville, Wisconsin

EDITOR:

What a wonderful prospect you outline—to give us more fine color pages like that magnificent salute to Arizona! I certainly hope you can do so . . .

George W. Mumford
Advertising Manager
Michigan Bell Telephone Co.
Detroit, Michigan

EDITOR:

I would like to see more in the magazine about planting more black walnut trees here in the Middle West. This is a good commercial crop as you well know, and it seems they are reducing in number in Iowa.

Homer W. Denniston
1121 Monroe Drive
Newton, Iowa

EDITOR:

Is there any way I can beg, borrow or steal a couple of extra copies of those beautiful views of Arizona in your October issue of *American Forests*? They are worthy of framing and hanging in honored places for their beauty. I hope you will continue this practice of putting in more photographs such as these. With best wishes.

John B. Hatcher
Forest Manager
Atomic Energy Commission
Savannah River Project
Aiken, South Carolina

EDITOR:

. . . I have thoroughly enjoyed this issue and especially the presentation on Arizona. Having traveled Arizona rather extensively, it brought back many fond memories and unveiled many pictures which had been clouded over through time. . .

From my point of view you have a very fine and well-prepared magazine which is interesting to read. This new idea for a feature, namely the Salute to Arizona has considerable merit and I hope to see it continue through succeeding months. May

I also extend my congratulations to the photographer whose color shots were used; they were very fine.

Milton W. Heath, Jr.
54 Dean Road
Cochituate,
Massachusetts

EDITOR:

In the October issue of *American Forests* you request the readers to write in if they enjoyed the October issue. I want to say that I enjoyed it very much . . . I also thought the color pictures were beautiful and would like to see more of them.

Ralph H. Bowen
719 Cleveland Ave., S.W.
Canton 2, Ohio

EDITOR:

I just want to commend your publishers on the excellent October issue of your magazine. It was an exceedingly fine piece of work and much enjoyed . . .

Mrs. Henry B. Kennedy
44 James Lane
Cohasset, Massachusetts

EDITOR:

I was quite impressed with the wonderful color pictures of Arizona in your October issue. Please continue them if possible . . .

Pete Wyckoff
Box 1295 Star Route
Sonora, California

EDITOR:

. . . You sure put some color and more class in the magazine.

Lewis C. French
The Milwaukee Journal
Milwaukee, Wisconsin

(Note—These letters praising the colored pictures of Arizona in the October issue are just a sample of the numerous complimentary letters we received.—Editor)

Comment from Minnesota

DEAR MR. POMEROY:

When I saw you in St. Paul at the October 3rd meeting of our Land Ownership Committee I wanted to discuss with you the article in the September, 1958 issue of *AMERICAN FORESTS* on the Grand Rapids meeting of our committee. However, because of the rush of other business and the fact that you had to leave early, there did not seem to be an opportunity to talk to you about this.

Because we were not able to discuss this in St. Paul I have decided to send you my comments on the article.

We have been somewhat concerned about this report, because it seemed to us that you were making a case for increased government ownership in Minnesota without

(Turn to page 64)

Reading
about

RESOURCES



By MONROE BUSH

THE WILDERNESS QUESTION

RECENTLY two documents have become available which sleep in the same bed, but which are surely the two strangest of all strange bedfellows.

The finest things in life are admittedly fragile, and we do not need to live long to learn that to handle beauty at all we must handle it gently. But the processes of legislation could scarcely be described as gentle. When it becomes necessary for some delicate aspect of human experience to be dissected in legislative debate, the end result is what we find in the published **Hearing on S. 4028**, the Senate committee hearings in regard to the proposed National Wilderness Preservation Act (U.S. Government Printing Office, Washington, 1958).

This 218-page document, addressed to the subject of wilderness preservation, contains four sections: (1) the proposed act itself, with departmental commentary; (2) twenty-six statements concerning the act from spokesmen as diverse as Howard Zahniser, Harry S. Mosebrook, Wayne Morse, and Kenneth Pomeroy; (3) letters and telegrams from more people than I can count; and (4) "Additional Information" for the truly indefatigable. As you might suspect, there is scarcely a frivolous word to be found, and the argument revolves chiefly around the issue of the wisest means of preserving wilderness, since all the spokesmen I checked appeared committed to the ideal itself.

Getting back, now, to this matter of bedfellows, we have a companion piece, **Listening Point**, which is veteran outdoorsman Sigurd F. Olson's

hymn to a particular piece of wilderness high in the lost Quetico-Superior country (Alfred A. Knopf, New York, 1958. 243pp. \$4.50).

Both documents are, each in its way, arguments for the value of wilderness. Both contain much insight wrung from sincere experience. But here the strangeness of these bedfellows becomes apparent, because **Hearing** is an analysis of what cannot be analyzed. Necessarily, perhaps, it turns loose a legion of arguers to examine the subject of wilderness as if it were a tariff rate or a military budget. This is part of the game—the proper way, that is, for issues to be settled.

Hearing on S. 4028 is alternately shrill and tedious; it is argumentative and, on occasion, snide; yet it is always earnest, which results in its not infrequently being confusing. But when it pleads for wilderness, as it often does, it becomes clear as a summer-blue sky that men know better what is good for them than how to attain it. And what is good for them is what Sigurd Olson writes about. **Listening Point** describes the inherent spirit—that is, the inner value-substance—of wilderness. It is a book about the call of the loon, the sound of rain on tent canvas, the depth of the virgin sky in the darkness of cold night.

Of course, Olson would be the last to duck a fight. Surely he must applaud those of every constructive viewpoint who argue from sincerity for the preservation of wilderness. But the best arguments are never made before a Senate committee, and his book proves it. A night at **Listening Point** would be worth five

hundred pages of testimony.

And it is difficult to foresee the result of the mounting legislative struggle. Wilderness preservation, like freedom itself, is won in different ways at different times, and sometimes lost in part, and capable of being lost altogether. As a problem within the complex of our society, it is touched by every facet of this society, and so can be approached in diametrically opposite ways by equally honest men—as the testimony itself proves.

But one thing is certain: wilderness is shrinking. Each year there are fewer Listening Points on this booming continent than the year before. The mortality of the isolated is high. And the beauty of the isolated, the clean fresh integrity of true wilderness, is brought home to us with great impact by Olson's document of a wanderer amidst natural solitude.

He is no modern Thoreau, despite Mr. Justice Douglas' jacket blurb. There was only one Thoreau. Sig Olson is not a creative philosopher, and I suspect does not intend to be. This is a good thing for wilderness. The size of Thoreau's genius was forever obscuring the world he described, whereas Olson steps aside to give his reader the full splendor of the wild, natural beauty around him. He need not apologize for failing to obscure the view, but, like his readers, be thankful for it.

Listening Point is, as I first said, a hymn sung by the author, but sung again in the heart of every careful, sensitive person who follows its pages. It is a recognition of the natural world's majesty in simplicity,

of the purity of the untouched commonplace.

And since these values of the wild outdoors are apparent to us all, our mutual hope must be that out of the wilderness hearings in the Congress, and out of the constant discussion which continues, there will be found a mutually acceptable way to preserve a little of what God has made in the very condition in which He made it. There are things in this world which men can do nothing better with than leave alone.

NEW AND TO NOTE

Saga of a Forest Ranger, by Len Shoemaker. University of Colorado Press, Boulder, Colorado. 1958. 216 pp. \$5.00.

Here is a book as fast-paced as its subject, William R. Kreutzer, Forest Ranger No. 1. The man was simple, direct, and wonderfully effective—and so is Shoemaker's book.

This is a valuable, perhaps unique, account of the first days of a forest service, when problems were elemental and the solutions to them necessarily had to be also.


Saga of a Forest Ranger qualifies as required reading for every forester, at least for those with any romance in their bones. And it happily qualifies, as well, as pleasant, entertaining reading for every student of Americana. Ranger Kreutzer was the kind of man from which this country of ours was built.

The Outer Banks of North Carolina, 1584-1958, by David Stick. University of North Carolina Press, Chapel Hill. 1958. 352pp. \$6.00.

Graveyard of the Atlantic by author Stick was good historical adventure, but **The Outer Banks** is even better by every count. The second book was projected first; but in gathering material, young David Stick became so diverted by the fascination of the countless wrecks that had piled up on the Banks, that he put this together in a separate volume, **Graveyard**. But now the parent book is out, and worth the ten years that it required. **The Outer Banks** is a major work of local history, of interest to all thoughtful readers, but of particular importance to those of us concerned with resources.

We have long since got in the habit of regarding resources as something to be used, wisely if possible, poorly if necessary, but used in any event. The significance of **The Outer Banks** rests in contrast, in setting against our habit of resource use the spectacle of men who, with the cards

(Turn to page 41)



"You Mean You had

INDIAN

FIRE PUMPS

Way Back
Then
Grandpa?"

"Yes sirree, Buster, our department had them in 1925 and they're the dangdest best outfits made for small fires. Wouldn't be without 'em. Guess they're better than ever today. I see the boys at the station house still have a bunch of INDIANS on hand."

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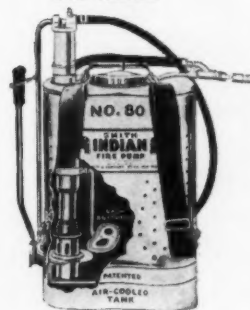
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Earl L. Koch, Asst. Chief
Ann Arbor, Mich. Fire Dept.

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CANADIAN AGENTS

Gathered at Chicago station (L.) Asst. Reg. Forester Louis Hermel, BLM Director Edward Woolley, Smokey, Postmaster Carl A. Schroeder, and Regional Forester Arthur W. Greeley



Smokey, standing in mail car of the Conservation Caravan, accepts first sack of conservation envelopes from Chicago Postmaster Carl A. Schroeder, just before departure



Caravan Wagonmaster Ken Pomeroy and wife Martha have a chat with Smokey at the rim of the Grand Canyon



THE CONSERVATION CRA

Albuquerque Postmaster John P. McFarland welcomes Caravan to city



Author Fred O. Smoyer and Mrs. Smoyer, of Akron, Ohio, were among the first to sign up for the Caravan, having been thrilled by Portland trip



One hundred and twenty-five strong, members of the Conservation Caravan gathered in front of station at Phoenix. After touring city, group continued to Tucson in buses

Den Mother of Albuquerque, New Mexico brought Cub Scouts to meet Smokey, and mail their envelopes



CARAVAN — ARIZONA BOUND

By FRED O. SMOYER

SIX special Pullmans with diner and lounge, attached to the Santa Fe Chief, left the Dearborn Station in Chicago on the morning of October 23rd, bound for Arizona. On board were 125 forest enthusiasts comprising a Conservation Caravan en route to Tucson, Arizona, 1,751 miles distant, and the 83rd Annual Convention of The American Forestry Association. We were chaperoned by the Chief Forester of the AFA, Kenneth B. Pomeroy, and his wife, and for good measure we had aboard Smokey Bear, the nation's chief forest fire fighter. Smokey entertained children at stop-offs made en route, who had gathered to place their orders for the new Forest Conservation Stamp. I shall try to record some, but not nearly all, of the things to be seen from our train window as we journeyed westward.

The writer of this article has been

privileged to accompany two previous caravans — to Portland, Oregon, in 1955, and Madison, Wisconsin, in 1957. I can heartily recommend these sojourns to any who are in need of recreation and who feel the need of turning from labor to refreshment. Through the courtesy of The American Forestry Association, numerous side trips have been arranged which have proven most educational. I am sure that the members of the Portland Caravan in 1955 will never forget our visit to the Weyerhaeuser Timber Company in Longview, Washington, and the Crown-Zellerbach operations.

Nor will we ever forget a memorable conducted tour through the Department of Agriculture's Forest Products Laboratory in Madison, Wisconsin, which was one of the highlights in connection with the

82nd convention. No one interested in forestry should fail in his lifetime to visit this laboratory, which is undoubtedly the finest of its kind in the world. It is a fantastic workshop where technicians dissect, crush, bake, boil, burn, twist, hammer, squeeze, soak, drop and stretch wood in order to test its mettle.

In dealing with the study of wood and its products, we deal with one of nature's indispensable resources. It is a resource that fortunately is renewable and is generally abundant. Some useful tree will grow on almost any kind of land except in regions of climatic extremes. We usually fail to appreciate the part that wood and its products play in our everyday life, and we are never out of reach of something that is made from wood. If you turn up the label

(Turn to page 42)



Robert W. Sawyer
Public Information



Richard E. McArdle
Public Service



Edgar C. Hirst
Business and Industry

AFA AWARDS *for Distinguished Service*

Clarence M. Malone
General Service



Arthur W. Sampson
Education



FIVE outstanding citizens who have made valuable contributions to the conservation of natural resources, and who have stimulated greater interest in conservation programs on the part of our entire citizenry, received The American Forestry Association's Distinguished Service Awards for 1958.

Mr. Lloyd Partain, member of the Awards Committee, made the presentations at AFA's annual banquet in Tucson on October 29. Paul M. Dunn is chairman of the committee, which includes Horace M. Albright, R. E. Bass, Samuel T. Dana, and Ernest F. Swift. They selected the award winners from more than 100 nominations. The following individuals were chosen for this special honor:

Robert W. Sawyer, former Editor of the *Bulletin*, Bend, Oregon. Award in the field of public information. "... As a champion of conservation for 36 years, he brought a crusading zeal and a keen legal mind to the task of holding up the mirror to all half-truths and distorted misrepresentations as applied to the public lands, on which he became a leading authority. . . His editorials, rightfully, have won him nationwide respect, and some of them on the public lands will live as long as the public lands themselves. . ."

Edgar C. Hirst, Chairman of the Board, Concord National Bank, Concord, New Hampshire. Award in the field of business and industry. "... first state forester (New Hampshire) in 1909, and organized a state forestry program that has flourished ever since. . . His contributions to forestry include use of bank loans to further the practice of forestry by small landowners, and the establishment of an effective forest taxation pattern. . . He is a man who has learned the art of making himself a thoroughly useful citizen. . ."

Richard E. McArdle, Chief of the Forest Service, Washington, D. C. Award in the field of public service. "... For there is a strong feeling among state and private foresters that he has done more for the advancement and cementing of state-federal-private relationships than any other individual. . . he has consistently been able to see beyond the boundaries of his own agency in placing the welfare and future of all the nation's forests above any one segment. This adds up to forestry statesmanship of a high order."

Arthur W. Sampson, Professor, University of California, Berkeley, California. Award in the field of

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What's NEWS across the nation

By JAMES B. CRAIG

"TOPPING TUCSON" WILL PRESENT QUITE A CHALLENGE TO AFA next year. "You'll have to go some to keep up with this one," H. H. Chapman told President Johnston at the conclusion of the 83rd Annual Meeting. However, AFA hasn't run out of ideas yet. Then too, staff members feel they emerged from the Tucson meeting stronger and more united than has been the case in a number of years. Tucson proved to be something of a rallying point for a number of groups—including many "elder statesmen" in forestry—who had drifted away from the association in years past. But they came to Tucson, took part, and seemed to enjoy it. Suggestions galore poured in on ideas for future meetings — in the press room, in the corridors and on field trips. One group wants to go to Alaska. It proposes to charter a boat, hold the meetings on board, and use the boat for headquarters from which to launch field trips within Alaska itself. Another group proposes a boat trip on the Great Lakes in conjunction with a Pennsylvania meeting — with a chance to visit Isle Royale, study the Porcupine Mountain proposition, and visit forestry operations in both the U.S. and Canada. Others, who were impressed by the plea of Dr. Luis Quintanilla that AFA help start similar organizations in South American countries, are talking up an international meeting, possibly in Mexico City.

HOW MANY FOREST CONSERVATION STAMPS WERE SOLD? We don't know yet, but it was quite a bundle. One dealer alone bought 100,000 at Tucson. At least one state forester bought a whole year's supply. Children who met the Conservation Caravan and Smokey (Bill Huber) at stops on the trip from Chicago filed their orders for many more. Many people at Tucson sent their entire Christmas card lists. That train, by the way, struck a noble blow in behalf of forest fire prevention. Smokey made personal appearances en route and also at Tucson schools, along with Special Assistant to the Postmaster General L. Rohe Walter and others. Walter, by the way, gave every impression of having the time of his life at these proceedings. Many of the passengers on the Caravan were repeaters who had also taken the trip to the Northwest. Which trip did they prefer? Opinions varied. Some preferred the Southwest. Others—mostly easterners—said they had never seen anything like Longview and the Crown-Zellerbach Corp. tree farms before. But all agreed both were first rate.

FOR THE BENEFIT OF THOSE WHO HAVE BEEN ASKING, that beautifully-staged pageant that was woven around the unveiling of the Forest Conservation Stamp was the work of Bill Bergoffen, of the Forest Service. Of all the various users of land who gave their salute to the big blowup of the stamp, the miner with his burro got the biggest hand-solid proof that AFA members haven't forgotten the aid the mining industry provided in helping to amend the mining laws in reference to surface resources on claims. The man with the burro, John Brinkley of the Forest Service, found it necessary to take his animal on the elevator to reach the stage. The elevator doors had just swung open and man and beast were emerging when a startled AFA member about to come aboard stepped back in surprise, stared and finally blurted, "What am I startled about — I'm a Democrat!"

STAFF MEMBERS OF THE BEND, OREGON, "BULLETIN" call Bob Sawyer, its former editor and publisher, "The House of Correction." This has to do with Mr. Sawyer's eagle eye in catching and correcting mistakes in grammar, punctuation and just plain misspelling of words. While he was as bowled over as anyone in praising the sheer imagination and creative talent displayed by the lovely Desert Museum, Mr. Sawyer nevertheless still was able to focus on a misspelled word on one of the signs. "What word is it?" Bill Carr, the museum's mastermind, asked when the word was passed along to him. Told the word was "procedure," Bill replied, "Oh,

(Turn to next page)

that's not so bad. It might have been one of the trees. On one sign we had the word 'fir' spelled 'fur' but we caught that in time." This museum, by the way, is a modern wonder of the world. On a Tucson television program with Don P. Johnston, Chief McArdle of the Forest Service said he had been in museums all over the world and had never seen anything like it. The museum's educational potential will prove tremendous, he added.

A PLEA FOR FREE AND OPEN AGRICULTURAL MARKETS was made by Keith Waldon, of Arizona's Farmer Investment Company, at the Frank Appleton Farm in Pima County, when AFA members stopped there en route to Nogales, Mexico. Urging members to "tell the folks back home what one Arizona farmer told you," Waldon said Pima County Soil Conservation District people pioneered in asking for both farm price reductions and the elimination of all controls. "We only ask to be permitted to operate in a free market, uninterfered with by a bureaucratic agency," he said. "People who own land, and are close to it, know how to use it best." What was Mr. Waldon getting at? Just this. According to him, a total of 852,000 farmers today are producing cotton under stiff controls. Of this number, 375,000 are producing cotton on five acres or less and over 500,000 on 50 acres or less. It is impossible to produce cotton on five acres or less and put the same amount of acreage in year after year and still compete with foreign markets, Waldon said. For the good of the soil and the good of the crop, it would be far preferable to permit farmers to put in as much as 500 acres every fifth year and permit the land to rest the other four. "This is not a plea for bigness—its a plea for efficiency," Waldon stressed. "What forestry has done along these lines represents everything good. You people could really help by urging that some of this cotton acreage be put back into trees and pasture." Waldon claimed the price of cotton could be reduced to 21 cents if the government would take itself out of the picture.

AFA'S BOARD OF DIRECTORS tossed out a proposed water resolution at its Tucson meeting. "We're down here to observe and study, not to pass edicts," the board said. A special committee will make a full report to the January meeting. Upshot of it all could be a major overhaul and strengthening of the present water policy of the association as drafted at Higgins Lake. Following the convention, board members said they were thoroughly satisfied with the temperate, factual presentations that were made covering all facets of the Southwest water problem, as illustrated by movies and slides. "The emphasis on research by all concerned was a commendable feature of this meeting," one board member said. This water problem is covered at considerable length elsewhere in this issue.

ANOTHER ASPECT OF THE PROBLEM which the AFA meeting did not dwell upon at length concerns mounting friction between the federal government and the states on the question of "whose water is it?" Acts passed in 1886, 1870 and 1872 gave them control of water on non-navigable streams, the states claim. Not so, says the Department of Justice — these acts made "no grants" to the states but merely granted the appropriators water rights acquired under state laws. This would seem to be borne out as a result of the Court's ruling in Oregon's Pelton Dam Case of 1954. The Court ruled that the federal government has complete control over reserved lands in the public domain and that it can license such lands for the development of hydroelectric power without regard to state law. At Tucson, Mr. Backman, of Utah, stressed that the states "must retain jurisdiction and control." To do otherwise would abrogate a system over 100 years old, he said. There are others who are not so sure about this, we learned. If state laws are so good, why do they permit cattlemen to file claims on every water hole on Arizona national forests, they ask? If the mining claims system prior to their amendment wasn't good, why is this any better, they inquire? "Public interest," one learns further, depends on who is providing the definition. People who profit under the program of prior appropriation on water prefer to see things left as they are. But others who have only recently moved to the area from other states aren't so sure of this, we learned. And a lot of people have moved and are moving to Arizona these days. As Dr. Dana told a Cosmos Club lecture last winter, "Whether federal or state control is preferable from the conservation point of view is a moot question." Certainly this growing water problem is one that will call for great patience, restraint, and an all-out effort to make sure the public sees the whole picture.

A Splendid Gift

October 27, 1958, marked the 100th anniversary of the birth of Theodore Roosevelt, a date that coincided with the opening day of AFA's annual meeting at Tucson. To commemorate the occasion, the Theodore Roosevelt Association presented a copy of the famous Laszlo portrait of Mr. Roosevelt to the association. The presentation was made by Karl T. Frederick, (see cover) of Rye, New York, a trustee of the Roosevelt association, who is also the senior member of AFA's Board of Directors.

In his presentation remarks, Mr. Frederick said that Mr. Roosevelt was not the first conservationist in the world, or even in the United States. He recalled that Mr. Roosevelt was but a sickly boy when The American Forestry Association came into being. Nevertheless, Mr. Roosevelt must be recognized as the first national figure to give conservation principles "scope," by not only recognizing those principles but by actually putting them to work, Mr. Frederick stressed. To do this, he accented the importance of forests in the lives of people, and was aided in this work by such men as Gifford Pinchot and Charles Lathrop Pack. The fusion of these

principles in Mr. Roosevelt's day was such that Mr. Pinchot was later to comment that the "conservation idea had stretched so greatly it covered the whole world and everything in it," Mr. Frederick said.

Mr. Roosevelt, the speaker continued, had many friends in England, including the late Lord Lee. This noted Englishman commissioned Philip Alexius Laszlo, a naturalized British portrait painter born in Budapest, to do a portrait of his American friend. The original portrait now hangs at Chequers, England, the country estate of British prime ministers, and it is generally recognized as one of the best of the Roosevelt portraits. Among other "greats" painted by Laszlo were Prince Hohenlohe, Pope Leo XIII, King Edward VII and the ex-Kaiser.

The appropriateness of this gesture on the part of the Theodore Roosevelt Association was greatly appreciated by more than 400 AFA members at Tucson, and they warmly applauded Mr. Frederick's remarks. In accepting the portrait, President Don P. Johnston said it will occupy a place of honor in the association's Washington headquarters.

American Forester Honored

It is not too often that an article or book written by an American forester makes any great splash in Scandinavian countries, where scientists measure their forestry in terms of centuries rather than decades. To the Swedes, for example, American forestry is something of a Johnny-Come-Lately and problems that we are just now beginning to encounter were met and overcome by the Swedes fifty or more years ago.

For this reason, we can learn much from European and Scandinavian foresters, and this is as true in the field of publishing as anything else. The excellent Swedish forestry journal, for example, which strikes a sort of happy medium between the *Journal of Forestry* and *American Forests* in this country, is a scrupulously honest, exact, and lively publication. It has one mission in life—to tell the truth, and it does so. In fact, Swedish forestry research and writing of all varieties is equally meticulous and exact.

As can be readily understood, people with standards of this caliber do not bestow honors lightly, and it is for this reason that American forestry has been signally honored with the announcement by the Swedish government that Raymond E. Marsh, former assistant chief of the Forest Service, has been made an Officer of the Swedish Royal Order

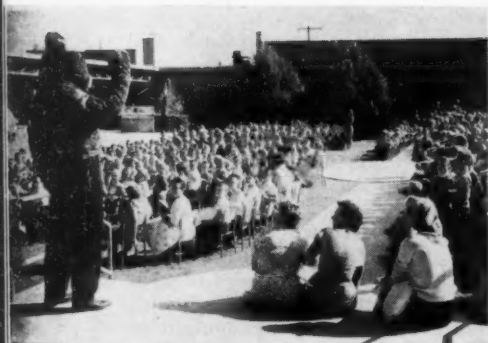
of Vasa, both as a recognition of his services in making Swedish forestry better known in the United States and as a symbol of friendship. The Order of Vasa, created by King Gustavus III to honor the Vasa dynasty, is an order of merit seldom bestowed on foreigners. So far as is known, it has never before been awarded to an American forester.

Basis of the award to Mr. Marsh was the report on Scandinavian forestry he prepared as a Forest Service collaborator and which Swedish foresters say is the most brilliant report of its type ever written by a visiting foreigner. To prepare himself for the task, Mr. Marsh learned the Swedish language and consequently was able to meet Scandinavian foresters on equal terms. First published by the Pack Forestry Foundation in 1954, the report was entitled, "Public Policy Toward Private Forest Lands in Sweden, Norway and Finland." It was reviewed in the July, 1955, issue of *American Forests*.

American Forests congratulates Mr. Marsh on both his award and a report that is now being translated into several foreign languages. More specifically it congratulates the American forestry profession, of which Mr. Marsh is a product, on this tangible indication that the voice of American forestry is being heard around the world in increasing volume.



TUCSON CONVI



Smokey, played by Bill Huber of the Forest Service, performed for Tucson youngsters



At stamp presentation were (l.) Karl Frederick, AFA director, L. R. Walter, P. O. Dept., Pres. Johnston



Rose Canyon Recreation Area of Mt. Lemmon where group was treated to a fine barbecue



Everyone wanted stamps, here sold to Mrs. Lee Bowler, Post Office Dept., as X. L. Pellicier (center) waits



THERE were highlights galore at 83rd Annual Meeting of AFA, termed by many the "best" in history. Most outstanding included the presentation by L. Rohe Walter, special assistant to the Postmaster General, of the Forest Conservation Commemorative Postage Stamp; the keynote address by Dr. Richard E. McArdle; the movie premiere of "Vision in the Valley," the story of the Muskingum Watershed Conservancy District; an address by His Excellency Dr. Luis Quintanilla, Ambassador for Mexico to the Organization of American States; the performance of the Tucson Boys

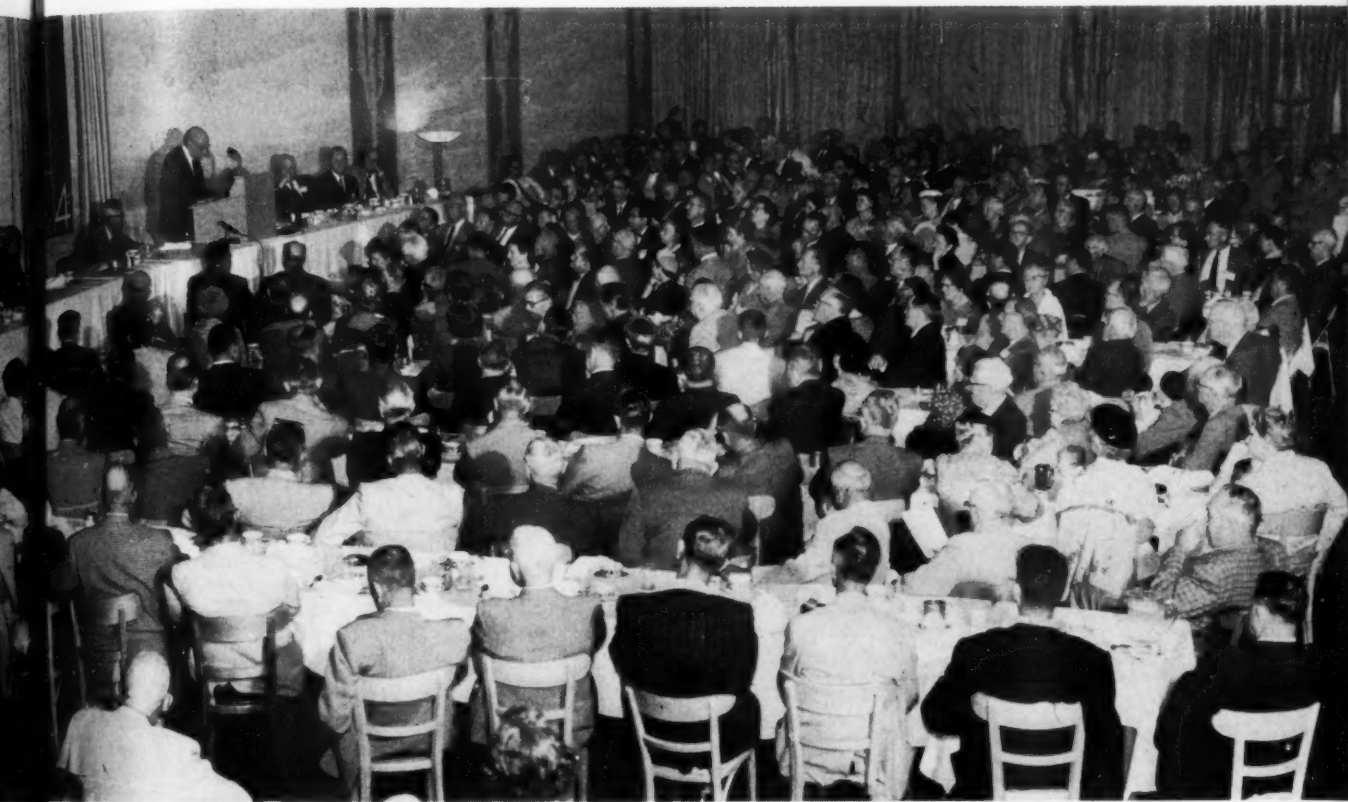
Chorus; the dedication of the watershed exhibit at the Arizona-Sonora Desert Museum; field trips to the Coronado National Forest and Mexico; and unusually informative panels on Southwest water problems. A total of 444 registered.

Presentation of the stamp was preceded by a pageant in which a color blowup of the Rudolph Wenzel design was unveiled by Smokey Bear. Users of the forests next presented their salute to the stamp. Mr. Walter then made his remarks, and presented stamp albums to President Johnston, Arizona officials, and conservation leaders in America.

Mr. Walter said, "There could not be a more fitting time, a more fitting place, nor a more fitting assemblage before which to dedicate the Forest Conservation Commemorative Stamp than here in Tucson at the 83rd Annual Meeting of The American Forestry Association, which since 1875 has been in the forefront of the nation's forest conservation efforts."

The stamp, which went on sale in the 36,605 post offices in the United States, "symbolizes the remarkable progress already made in the United States in forest conservation, as well as the massive job still facing this expanding nation. The dedication of

CONVENTION "BEST YET"



this stamp also happily honors the 100th anniversary of the birth of Theodore Roosevelt."

The stamp, Mr. Walter continued, constitutes a salute to "wise use forestry"—the type envisioned by Mr. Roosevelt—and the pictorial cancellation featuring "Smokey" and "Keep America Green" is a salute to the forest industries "and many other timber owners who are today practicing a high standard of forest management, by handling their woodlands as continuous forest croplands."

These owners are practicing forest conservation and making it pay,

and are therefore setting a splendid example for other timberland owners to note and adopt, Mr. Walter said. "The fact that we now have ten times as many self-employed consulting foresters at work in the country as we had in 1946 is further testimony to the fact that people are hiring foresters to manage their woodlands because it is good business to do so."

The year 1957 was a banner year for conservation, Mr. Walter continued. Georgia had the honor of planting the year's billionth forest tree, and just recently President Eisenhower presented Smokey Bear

statuettes to representatives of the forest industries, the Advertising Council and the AFA in recognition of the "exceptionally fine forest fire prevention record established in 1957 when the 100,000 annual forest fire mark was cracked downward for the first time with only 83,400 forest fires reported."

The Post Office Department itself has an important stake in trees, Mr. Walter said. "It handles more than 14 million pounds of woodland products every 24 hours, either as cards, letters, magazines — including your fine magazine *American Forests*—newspapers, cartons, or wrapping pa-



Rudy Wendelin (r.) designer of the stamp, received standing ovation when Spec. Ass't to Postmaster General L. R. Walter presented album

per, plus 25 billion stamps we sell each year.

"Looking ahead, our nation's skyrocketing population, with its mounting demand for forest resources, presents a tremendous challenge," Mr. Walter stressed. "Our people will need more water, more wood, more wildlife and more outdoor recreation year by year. To meet these needs, our foresters tell us that just 40 years from now, we must be growing twice as much timber, yearly, as we now grow. This is a real challenge which will be met successfully because associations such as yours; educators, conservation-minded groups and individuals; and dedicated public and private forestry agencies know more about forest conservation and more people are interested in forest conservation than ever before."

For about two decades now, rural mail delivery men have cooperated with the Forest Service and the state foresters in watching for and reporting fires, Mr. Walter said. Now, through the sale of 160 million of the new four-cent forestry stamps "all Americans will be reminded once again of the importance of the nation's forest conservation program in conserving, protecting and adding to a great natural resource."

This stamp "seems destined to be one of the most popular ever issued by the Post Office Department," Mr. Walter concluded.

The accent on multiple use research, with emphasis on Southwest water needs as reflected by both gov-



Outstanding exhibit at new watershed exposition at Desert Museum was Forest Service diorama entitled "Water ... from mountain to valley"

ernment experts and private land users, was a solid source of satisfaction to the members. As Board Member Edward P. Stamm, one of the panel chairmen, commented, "The meeting was a liberal education for all of us." The presence of AFA in Arizona for the first time had a stabilizing effect, according to government and private leaders alike. The keynote address by Forest Service Chief Richard E. McArdle that you "can't push nature around," harking back as it did to the ecological teachings of Aldo Leopold, served as a warning to any individuals who might desire to push unproven watershed ideas too rapidly without thorough research.

At the same time, AFA members from every state in the Union and nine foreign countries learned many things they did not know before about acute water needs in Arizona, and saw some of their pet theories exploded or shaken by panels of experts. Two points in particular were driven home by these experts. The first was that Arizona's water problems are unique and can't be compared to most eastern, midwestern and northwestern states. The second was the admonition by such experts as Raymond Price, director of the Rocky Mountain Experiment Station, and Dr. Harold E. Myers, of the University of Arizona, that we can't afford to "generalize about water." The assumption that trees draw water, for example, is strictly an assumption, these people pointed out. Nor are all watersheds alike.

The meticulous care with which southwestern experts unfolded their presentations and answered all questions was a clearcut indication to most observers that Arizona will follow the research road in making any drastic changes in watershed cover. Many AFA members went to Arizona with doubts in their minds as to the efficacy of current water programs down there. This was largely the result of somewhat radical statements that were made there following the publication of a water study in the state. This report—the Barr Study—contained some revolutionary concepts, although it was qualified for the most part along general research lines. Some of the magazine and newspaper stories that followed the report were anything but qualified, however.

To a large extent this situation now appears to be stabilized. The Forest Service is adept at this sort of thing, and apparently it is receiving

support from an organization of representative citizens and land users called the Arizona Water Resources Committee, of which Kel M. Fox, a rancher, is secretary. *American Forests* had several long talks with Mr. Fox, Joseph F. Arnold, director of the Arizona Land Department, and others interested in increasing water yields in the state. An article by Mr. Fox appears on page 25 of this issue. In general, reports that have filtered into Washington that these Arizonians are pressing for drastic changes in the watershed pattern unmindful of research are not borne out by the material we unearthed on the spot.

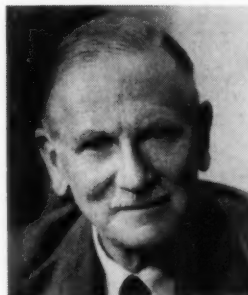
The very word "drastic" makes these men buck, we learned. In in-

troducing a film entitled "Recovering Rainfall" to the convention, Mr. Fox carefully commented, "Chief McArdle remarked . . . that there are some people here in the Southwest who would offer 'drastic' solutions to the area's water problems. Make no mistake, the Arizona Water Resources Committee is not among them. We want each of our recommendations to undergo precise tests, in the field, before it is incorporated in the management program of any federal agency. And to this end we have been cooperating closely with such outstanding conservationists as Fred Kennedy, Ray Price, and members of their teams in Region Three of the Forest Service."

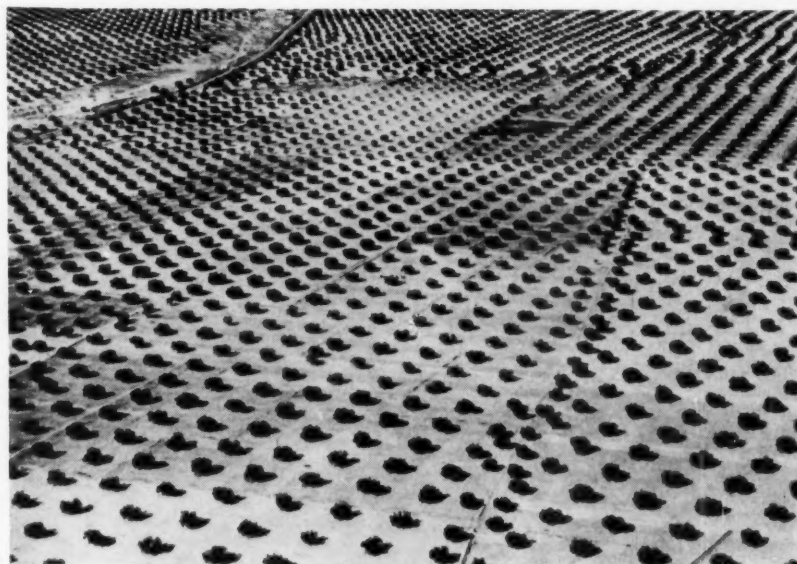
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Where there was Sand

Sir Richard St. Barbe Baker Is Guest
at AFA's 83rd Annual Meeting



COMPARED to the Sahara Desert, Arizona's water problems do not present a major water problem to Sir Richard St. Barbe Baker, England's "Man of the Trees" and author of "Green Glory" and "Sahara Challenge." As this noted Englishman says, where there was sand a few years ago in the Sahara (see below) there are now 26 million planted trees. Mr. Baker advocates total war against deserts, and insists that they can all be reclaimed.





Dr. John P. Shea (r.) first to study psychological aspects of forest fire prevention, describes theory to Ken Pomeroy



Don P. Johnston (r.) an early supervisor of the Coronado, reminisces about the old days with the present supervisor, Norman Weedon



CORONADO'S



AFA members were treated to a western style barbecue on the Coronado National Forest. Scene was Rose Canyon Recreational Area near top of Mt. Lemmon in Santa Catalina Mts.



This group of Texans apparently enjoyed the barbecue. They are from left: Dooley Dawson, Houston banker, Mrs. Dawson, R. E. Wagoner, president, Texas Forestry Association, Clarence Malone, another Houston banker, Mrs. Malone

GOLD

By NORMAN P. WEEDEN

WELCOME to the Coronado National Forest—a great natural watershed of southern Arizona.

You know, there is magic in the words "southern Arizona." Magic that draws thousands of human beings each winter from their workaday homes in the U.S.A. and even from other countries. Much of the magic is in the mild winter climate, the bright blue skies, the opportunity to rough it on ranches in the sunny valleys or the craggy mountains, and the feeling of freedom that comes with space stretching out to limitless horizons.

That is where the Coronado National Forest makes one of its important contributions to Arizona and to the nation. For visitors who want to "go places and do things," the forest has attractions without number in its 1,870,000 acres. In the cowboy's idiom, you could say these attractions stretch out "from hell to

breakfast," which in this case means from these Santa Catalina Mountains to the Mexican border on the south, and from the Tumacacori Mountains on the west to the Peloncillos on the New Mexico line.

Some recreationists might think of this million-plus acres of national forest land as a vast "dude ranch," but that would be true only in a limited sense. Surely the "ranch" has its scenic beauties and offers endless opportunities for outdoor fun, but it is a "working ranch" in other ways, too. It has jobs to do, in producing yields of water for farm crops, in providing forage for livestock and wildlife, and in growing timber for a growing region.

Man has measured this land in terms of rich resources since that gallant don, Francisco Vasquez de Coronado, explored it in the name of the king of Spain in 1540. This Spanish nobleman and soldier, for whom the national forest is named,

led a large force of cavalry and foot soldiers through this area on his luckless journey from Mexico City in quest of the "Seven Cities of Cibola." He followed the San Pedro River to the Gila River, worked north to the sources of the Little Colorado River in what is now the Apache National Forest, and continued into the Land of Cibola, the Pueblo Indian Country of New Mexico. There was no pot of gold at the end of his rainbow; the "cities" rumored rich with gold and paved with turquoise were only modest tiers of adobe houses. Coronado retraced his hard-won steps, broken-hearted, but the natives of Cibola and what is now southern Arizona continued to use what they knew was the real wealth of the area—the water and the fruitful soil.

The men of the Cross perceived this. When Padre Kino, destined to fame as a shepherd of souls and builder of missions, came up from the Mexican province of Sonora about 1692 and preached to the tribes along the Santa Cruz, San Pedro, and Gila rivers, he brought them new varieties of grain and vegetables and helped them raise cattle, sheep, and horses. Padre Kino knew this soil needed but the touch of water to make it bloom.

This truth was there for all to see, and white settlers came with their seeds and plows, their herds and their hopes. Eventually the urgent need for protecting the source of the precious streams and the underground flow led to creation of "forest reserves" in 1902, embracing the Santa Catalina, Chiricahua and Santa Rita mountain ranges. Today the Coronado National Forest includes these ranges and many others in its 12 units—the Whetstone Mountains, the Dragoons, the Tumacacoris, the Patagonias, the Huachucas, the Peloncillos, Winchesters, Galiuros, Pinalena, and the Santa Teresa. The national forest contains the headwaters of the Santa Cruz, San Pedro, Whitewater and San Simon rivers and valleys and the Sulphur Springs Valley, all of them important agricultural and livestock areas.

The forest is being managed and developed by technically trained men of the Forest Service. In a sense

(Turn to page 52)



Museum officials accept exhibit. Secy. Dr. Joseph Wood Krutch (speaking), Director William Woodin (l.)



Distinguished visitors view exposition. At left, Arthur N. Pack, pres. Charles Lathrop Pack Foundation, AFA President Don Johnston, Forest Service Chief Richard McArdle, Museum founder William H. Carr, and Governor Obregon of Sonora, Mexico

The Watershed Exposition is the most recent addition to the Arizona-Sonora Museum. The exposition which covers three acres of natural, living desert, was built at a cost of over \$200,000



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The Saga of "WATER STREET"



Group examining pictorial exhibit on Water Street: left, Mrs. James Stevens, James Stevens, noted author, Dave James, Simpson Timber Co., George Drake, AFA director

FOR SOME YEARS, naturalist William H. Carr has been saying that "preaching, publishing and prosecution" are not enough in conservation. You've got to "show them," Mr. Carr believes. His vehicle to accomplish this mission is the "living museum." Last month at Tucson, Arizona, AFA members were privileged to participate in the dedication of the newest creation by Carr and a talented staff—the Watershed Conservation Exposition at the Arizona-Sonora Desert Museum.

This exposition seems destined to exert a revolutionary impact on conservation education. It was first described by Mr. Carr in the October issue of *American Forests*, and inquiries along "how to do it" lines

have already been received from several public-spirited citizens. Conservationists at Tucson were unanimous in stating that this exhibit marks a revolutionary step forward in watershed education—a combination of creativeness, scientific "know-how" and showmanship. In short, the appeal of the project is such that it appears destined to catch on.

In accepting the exposition from its patron, Arthur N. Pack, Museum Secretary Joseph Wood Krutch said, "Conservation requires knowledge. This requires 'familiarity with' and 'knowledge about' the subject. Conservation has to start with a love of the natural world. Familiarity with the natural world marks the start in

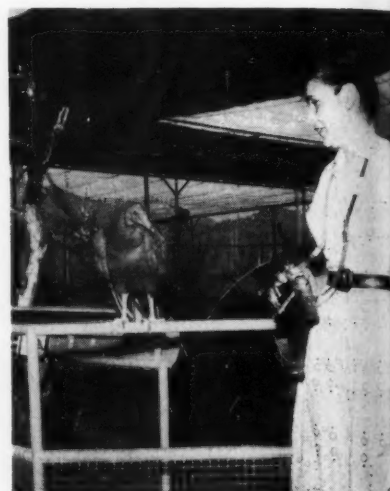
this process, and this creates the desire to conserve. But to do this you need 'knowledge about'—or, if you like, call it scientific knowledge. Some of our principal conservation problems are concerned with water, and this exhibit is designed to teach a course of instruction on that subject."

This course of instruction—it might be called "pushbutton conservation"—consists of a tour of "Water Street." By pushing buttons as he proceeds down the avenue, the visitor is fed facts, and invited to put those facts to work. For example, you can push a button and make rain. Still other buttons invite you to make readings of delicate electronic instruments. If the ex-

Mr. and Mrs. L. E. Dimmette appear to be amused at Mr. George W. Merck, Jr.'s efforts at trying to coax a "peep" from the roadrunner



Below, the Forest Service's diorama on water from the mountain to the valley, depicts Catalina Mountains down to desert floor.



Kate Swift, American Museum of Natural History, studied "living" exhibits

planatory recordings at each station fail to answer all the visitor's questions, he may push yet another button that puts him in direct contact with a staff member in an observation tower who answers the inquiries.

The exhibit grabs the visitor's attention at once with the question, "What does water mean to me — an average citizen?" Just this, is the reply: During 1955, the citizens of the United States used enough water to flood the entire state of Texas to a depth of one and one-half feet. And by 1980, it's estimated we'll use enough water to flood Texas to a depth of four feet. That's a lot of water, and the question is next asked, "Where does water come from? Where is it going? And — what are we doing to save it?"

The importance of "saving it," is further stressed by the statement,

"How long could you live without water?" And the answer is, "Here, in southern Arizona, about *three days*."

Just what is a watershed, the commentary next asks? The answer is, "For all practical purposes, a watershed is any region or surface that receives and distributes water. It can be thousands of square miles — such as the great watersheds that feed the Colorado River or Sabino Canyon Creek — or it can be the roof of your home, which may feed water down a drain pipe."

A single drop of water strikes unhealthy or abused, mismanaged soil with terrific explosiveness, the exhibit shows. A single drop of water may splash twenty or more soil particles into the air as it falls on bare or hard soil, whereas healthy, protected soil permits "soak and seep" storage for use later in springs. In

telling the story of soils and what is bad and what is good for them, the museum collaborated with the Soil Conservation Service.

The visitor does not have to proceed down Water Street far to learn that man has terrific competition in his quest to conserve, manage and use those single drops of water. He must overcome obstacles of his own making — poor soil conditions caused by overgrazing, by plant stripping and general mismanagement. And when man mismanages the gift of water, nature takes it back. The sad story of evaporation was described as "here today — gone tomorrow." In 1957, Arizona lost more than 75 million acre-feet of water, most of it from evaporation. (An acre-foot is the amount of water one foot deep covering one acre of land.) Ways and means are being researched on how to reduce these losses, one being

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use of a chemical called "hexadecanol" which forms a harmless microscopically thin shield on the water surface. The displays also show how man is experimenting with different types of plastic cover to protect the water from solar heat.

Loss of water from transpiration is vividly shown in another series of exhibits, and one learns that a single sunflower plant may lose 145 pounds of water in 140 days, or an average loss of one pint a day, through transpiration. A single corn plant has been known to lose 400 pounds or 50 gallons of water in 100 days. An acre of corn loses over 300,000 gallons, or about 1200 tons of water in 100 days.

"So this is another water loss that must be considered," the exhibit states. "What about weed plants which grow along stream beds? How many millions of gallons of water do they take away from us? What should we do about it?"

At one point in his travels, the visitor finds himself in a cage containing a watershed and all the plant life and birds and animals on it. This is to remind the visitor that each one of us "is really a part of the overall picture, of nature —

life — dependent upon the resources Nature provides. While we humans CAN control our own environment to a certain extent, it is more obvious, now than ever before, that we, as LIVING THINGS, survive only as we learn about the interrelationship and the interdependence of all living things.

That cage is a good place for any visiting human to sit and reflect. There he is — locked in with all the things that grow and live at an altitude of 3,000 feet with an average rainfall of eleven inches. As you sit there, a turkey buzzard ambles by and takes an exploratory peck at your pants leg.

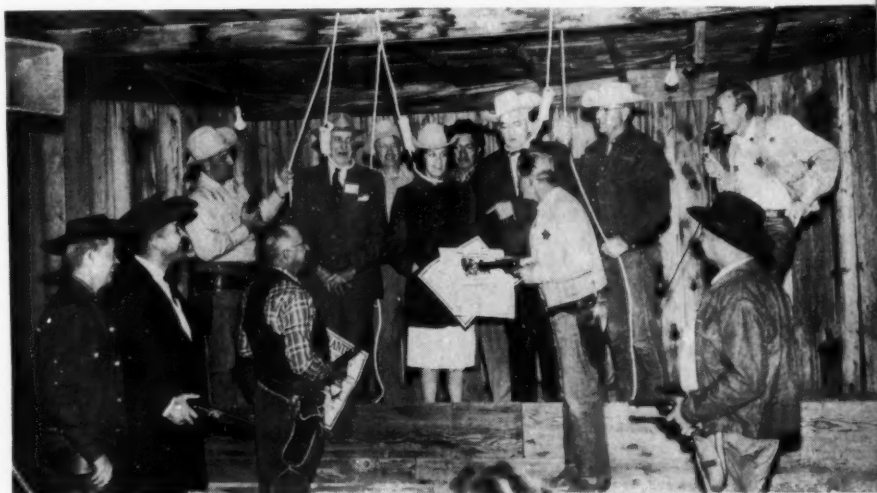
The final exhibit — someone re-

ferred to it as the "clincher" — is a permanent Forest Service presentation titled "Water — from Mountain to Valley," which features lights, music, and narration, and a balanced story of Forest Service administration and research in connection with watershed protection, management, and development.

If this exhibit had used AFA's Program for Forestry as its Bible, it couldn't have presented a more effective sermon on Point Three of that program. This goal is to "obtain the maximum of economic and social services from our forests by realistic application of the principle of multiple use in their management."

About to be hanged for "Cattle rustling and bank robbery" by the peace officers of "Old Tucson" are, left, William S. Rosecrans, Senora Quintanilla, and Fred Hornaday, Exec. Vice Pres., AFA

Jaycees of Tucson put on a real "western" for AFA at "Old Tucson," which is a replica of the city as it appeared in the days when the West was wild





Dr. Luis Quintanilla, Ambassador for Mexico to the Organization of American States, addressed annual banquet

AN eloquent plea for peace in our time with the countries of the New World linking arms to help such a Utopia become a reality was sounded by Dr. Luis Quintanilla, Ambassador for Mexico to the Organization of American States, at the 83rd Annual Meeting of The American Forestry Association in Tucson, Arizona.

Speaking at the annual banquet of the association, the Ambassador said The American Forestry Association should give serious thought to the establishment of a hemispheric association patterned after AFA, composed of interested citizens "from your twenty sister republics in South America" that would work both for good forestry and for good relationships. The Ambassador strongly implied that trees—and the love of trees—could provide a powerful bond between republics at a time when the great need in both the New and Old Worlds is spiritual understanding and restraint.

The Ambassador's plea obtained a sympathetic ear from foresters present at the conclave, who right now are planning a World Forestry Congress in Seattle, Washington, in 1960. Other AFA members, who made a short jaunt into Mexico the following day, suggested that serious

thought be given to a possible future meeting of the association, perhaps in Mexico City—an idea that was warmly applauded by leaders in the Pack Forestry Foundation who have labored in this neighboring country for a number of years.

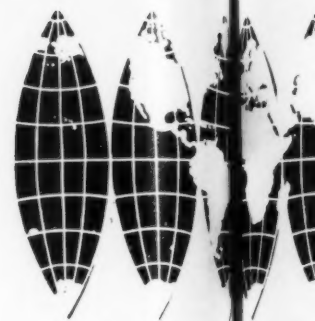
This international note as sounded by Dr. Quintanilla marked a decided departure from previous AFA meetings, where the main emphasis has been on United States forestry problems. Both Dr. Quintanilla and Sra. Quintanilla, a part-time student of forestry at the University of Maryland, made a hit with AFA members at Tucson when both fell in with the spirit of the meeting. In contributing to the high good nature of the affair, Sra. Quintanilla had good-naturedly permitted herself to be "hanged in effigy" by Junior Chamber of Commerce "vigilantes" at Old Tucson the night before. William S. Rosecrans, former AFA President and now a Regional Vice President, and Executive Vice President Fred E. Hornaday were "strung up" at the same time.

The American dream of peace through collective security can come true, Dr. Quintanilla said. It is a dream truly American, just as democracy is the fulfillment of an

American dream. However, the Ambassador revealed that the average citizen's concept of what is "American" is somewhat different than his own.

"People in the United States rightfully think of George Washington as the Father of their Country," he said. He then suggested that Simon Bolivar may have been an even greater patriot. Both Washington and Bolivar led revolutions that freed their individual countries from the yokes of intolerable bondage, he said. But Bolivar went even further in that he not only liberated his own country but also six other countries and then set up a policy of peaceful co-existence—a dream of peace—that anticipated both the League of Nations and the United Nations.

"I am not at all sure that Bolivar isn't the greatest man in history," the Ambassador said. "After freeing his own country he didn't say 'this is the end of the job'—he called an international meeting of sister republics in 1826 to finish the job, and thereby preceded both Woodrow Wilson and Franklin D. Roosevelt in declaring that peace in the community of nations is indivisible and is everybody's business. As such, Bolivar was the grandfather of the League of Nations."



Ambassador So International No



Sounds Note

The Ambassador said that neither imperial power nor the policy of a balance of power has brought peace to the world. "No power was ever big enough to tell the world what to do," he said. "Neither did we have more wars than under the system of deliberately organized and armed groups of nations."

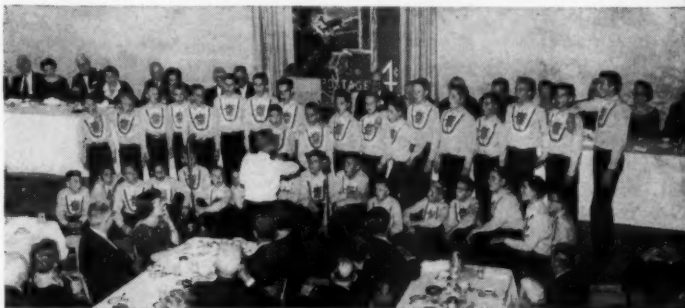
Dr. Quintanilla said the Organization of American States provides an example to the world of the way to peace in the United Nations. In 10 years, 10 disputes between nations have been settled. One great power—perhaps the greatest in the world—and 21 much weaker nations have outlawed violence in the Western Hemisphere, he declared, and implied that the same could be done elsewhere if people would recognize that spiritual power, rather than the power of armies, represents the desired solution.

Forestry—trees—can play a part in these solutions, he stressed, but urged that Americans remember that Brazil, for example, has more trees than all the rest of the hemisphere put together. Recognizing some of these facts can help to strengthen the ties of the 22 republics, he stressed again. Here, is the alternative to brute force.

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Winners of 1958 AFA Awards (left) Arthur W. Sampson, Richard E. McArdle, Edgar C. Hirst, Clarence M. Malone, Robert W. Sawyer



Nationally-famous Tucson Boys Chorus delighted banquet guests with their music. Dr. Quintanilla described them as blue angels

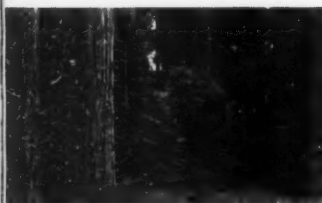
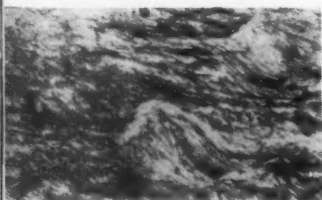


Sra. Quintanilla and her husband chatted with AFA members after the banquet. At right is The Reverend Jerry Wallace of Tucson Awards Committee Member Lloyd Partain (center) presents Award to C. M. Malone (left). Don Johnston (right) congratulates winner





Richard E. McArdle (l.) accepts AFA Award from Pres. Don Johnston



WATER, FORESTS, and PEOPLE

By **RICHARD E. McARDLE**

*Chief, Forest Service,
U. S. Department of Agriculture*



LADIES and gentlemen: I have one main thought to leave with you today. It's simply this: No one can push nature around and get away with it for very long.

This 83rd Annual Meeting of The American Forestry Association will stand out in the record book as one of your most remembered meetings. I am going to give you some of the reasons why I think you will remember this as a real red-letter date on your association calendar:

Here's one: So many of you participated in the association's Conservation Caravan en route to this meeting that the railroad finally had to make up a special train just for association people. This is success with a capital "S."

Here is another: For the first time you are meeting in the Southwest. Just by meeting here you will make the people of these states more conscious of their dependence on forests—of their need for forests not only as a source of wood but also for water, forage, wildlife, and recreation. And for those members of the association who are seeing the Southwest for the first time the meeting will bring appreciation of the growing importance of this part of our United States.

Here is the third reason: Tomorrow we join in opening to the public a remarkable new watershed conservation exposition at the Arizona-Sonora Desert Museum. Here, some three hundred thousand people a year will see at close range how land management can serve the needs of people for water. I do not know of any other place where you can see what you will see tomorrow on "Water Street" at the Desert Museum.

And a fourth reason: Immediately after I finish my part of this morning's program, we shall have the great privilege of helping the Post Office Department issue the first forest conservation postage stamp this country has ever had. Many communities and many organizations eagerly sought this honor which is now yours.

One other reason why this meeting has special meaning: October 27, 1958, was the one-hundredth anniversary of the birth of Theodore Roosevelt. The memory of Teddy Roosevelt should have a warm spot in the hearts of all Americans who love the forests, mountains, plains, rivers, and lakes of this great country.

This afternoon we will make a short trip to Rose Canyon and Mt. Lemmon in the Santa Catalina

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The ARIZONA Watershed Program

By **KEL M. FOX**

*Secretary-Treasurer,
Arizona Water Resources Committee*

GREAT ideas are sometimes hatched in the most unlikely places. Take the Arizona Watershed Program for example. It was conceived under a pine tree, far from any conference room, let alone human dwelling place.

Two men attended this fateful meeting: Jake West, a hydrographer, and Dave Wingfield, a rancher with a penchant for practical conservation.

Both came well prepared. Born on a farm near Silver City, New Mexico, West had spent forty years climbing the ridges and exploring the canyons of the vast Salt and Verde River watersheds. His job, certainly one of the most unique in the world, is to see that this huge area delivers enough water to irrigate the thousands of farms, homes, and budding industries of the Salt River Valley. Lean and keen, West looks and acts like one of the fabled "mountain men" who once tramped these same canyons in search of beaver pelts, and he probably knows these watersheds better than any man alive.

Any man, that is, with the possible exception of Dave Wingfield. Now in his mid-seventies, Wingfield was born not many miles from where he and West were chatting. He had worked cattle in that very country before Theodore Roosevelt made his celebrated ride up San Juan Hill. He could remember the week-long drives to the railroad, the lonesome hours in the saddle scattering grass seed from a gunny sack tied to the horn, an occupation that has earned

him the title of the "Johnny Grasseed" of Arizona. He could remember how this country looked fifty years ago, before there was a U. S. Forest Service.

The meeting between Wingfield and West began as an informal exchange of ideas on the same theme: Why were the lands of the Salt and Verde watersheds producing less water and less feed than they did fifty years before?

It ended with a conclusion, based on a century of combined experience: Something, probably the unregulated growth of brush and trees, was devouring the water and replacing the grass. If the brush could be controlled and the trees thinned, so they reasoned, springs that had vanished during their own lifetime could be made to run again, areas choked with trees and worthless brush could be restored to grass.

The theory found a responsive audience, and, before the year was out, the Salt River Project, the Arizona Land Department, and the University of Arizona were embarked on a project to test its theoretical validity. Experts, a majority of whom were affiliated with the Forest Service, were called in to study the watersheds and express their opinions. These opinions were compiled by a staff headed by Dr. George W. Barr, at that time Professor of Agricultural Economics at the University, and were printed in a report entitled "Recovering Rainfall," a report now almost universally known as the "Barr Report" after its chief author.

The Barr Report took the raw

theory of Wingfield and West and refined it into a broad program of recommendations for managing the various types of vegetation on the Salt and Verde watersheds. It predicted a considerable gain in runoff would result, along with such other benefits as fast-growing, better-quality timber, more grass, and improvement in game and recreational sites.

Its release met with a mixed reception. It was hailed in some quarters, questioned in others—notably by spokesmen for wildlife groups fearful of possible changes in game habitat. The Arizona Legislature was sufficiently impressed, however, to create a new division of watershed management in the state's land department to promote the program, and elsewhere a group of citizens

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Former Ambassador to the Court of St. James, Lewis W. Douglas, is chairman of Arizona Water Resources Committee



WATERSHEDS and their M



Speakers include (left) W. E. Silverwood, Edward Woozley, Arthur Pack, William Carr, Lawrence Mehren, Wilson Compton

■ Federal Responsibilities

By EDWARD WOOLEY

Director, Bureau of Land Management

YOU have honored the Department of the Interior and the Bureau of Land Management by your invitation to participate in this panel discussion on watershed management. It is a pleasure to share the platform with my distinguished colleagues on this important subject.

The federal government's responsibilities in watershed management are twofold. First, the federal government must provide sound land and watershed management on the nearly three-quarters of a billion acres under its jurisdiction. Second, the federal government has the broad watershed management responsibility of providing leadership for a wide variety of services to the multitude of public and private organizations and agencies that are engaged in the development and wise use of our country's natural resources.

The public lands, most of which are in rural America, include many of the higher water-yielding areas of the nation. Much of the land that is federally owned is by its own geography a watershed area. This fact alone means that federal policies and programs for water-

shed management have an important impact on areas of nearly every state of the union.

In practice the lands owned and managed by the federal government are handled by several government agencies for a wide variety of different purposes and reasons. But, whether the lands are within a grazing district, a national forest, or adjacent to a federal river or dam project, the principles of sound land and water use which constitute good watershed management must be applied.

The federal government's role in watershed management in providing coordination and leadership for both public and private resource development programs takes a variety of forms. These can be separated into three broad categories: (1) collecting basic data and research; (2) planning and project development, including programs and operations to promote wise and balanced multiple land and resource use; and (3) furnishing technical and financial assistance.

The need for collection of basic physical and other data as a prerequisite to the conservation of our resources is self-

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Mr. and Mrs. Edward Woozley selecting hats during shopping tour of Nogales



AMERICAN FORESTS

MANAGEMENT

■ State Responsibilities

By GUS P. BACKMAN

Secretary, Chamber of Commerce
Salt Lake City, Utah

IN presenting this subject I would like to express my appreciation to several fine gentlemen who have cooperated in the development of the theme—Mr. A. R. Croft, specialist in watershed management and a member of the staff of the Intermountain Region of the Forest Service, Mr. Jay R. Bingham, director of Utah Water and Power Board, Robert B. Porter, Assistant Attorney General for the State of Utah, Francis T. Mayo of the Utah State's Engineers Office, and William J. Hart, Deputy Utah State Forester.

First let us analyze the legal responsibilities of the states covering items of vital concern which, while being adequately covered in some states, have received little attention in others.

Critical study of water law, especially

as relating to ground water. It is the responsibility of the state to provide the necessary laws to control and protect our underground water resources. This responsibility has been recognized in the western arid states, particularly in the Southwest, but the problem is rapidly assuming national importance.

Federal or state jurisdiction to control the use of water. The states must retain the jurisdiction and control over all rights to the use of water. We have developed over the past hundred years a definite and proper system for the administration of water rights and for the distribution of water. To abrogate this system and to permit federal control would be a loss of these hundred years and would be one more step towards reducing the states to second class gov-



Gus P. Backman

ernments and their citizens to second class citizens.

Determination of water rights. We cannot emphasize too strongly that federal encroachment in the field of water rights must be discouraged and that state laws as to appropriation and use must be

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■ Citizen Responsibilities

By W. E. SILVERWOOD

California State Conservation Commission

IT is a great honor for this California Soil Conservation District farmer to have the privilege of presenting a citizen's point of view on "Watersheds and their Management" at this 83rd annual American Forestry Association meeting.

Recent Congressional committee studies reveal our national per capita use of water has increased from 450 gallons per day in 1900 to 1500 gallons per day currently in use. This tripled increase in 50 years has been due to our improved standard of living, which embodies our tremendous agricultural and industrial expansion. By 1975 it is estimated this per capita use of water will be increased to 2,000 gallons daily. Now, multiply these water needs by our nation's enormously increasing growth in

population and it is very understandable why water is becoming our *number one national* resource problem. Our annual water crop is our most valuable annual natural resource. It must be harvested and conserved as carefully and as quickly as we farmers harvest some of our perishable fruit crops.

Each succeeding year, every U. S. citizen is becoming more dependent upon the careful management and proper use of all of the natural resources in our nation's watersheds for his future supplies of food, fibre, forest products, and, most important of all, his future *supply of usable water.*

Here is what I mean by future supplies of usable water, with some illustrations from southwestern watersheds: With the ever-increasing use of chemicals

in the home, on the farm, and in industry, "salinity problems" are running "sufficient water supplies" a close race as to which is the most pressing watershed problem on many western watersheds. Every watershed where water is used and reused as it travels downstream continues to gain added contaminants. For example, 20 years of research studies of the Rio Grande River by the Salinity Laboratory of the U. S. Department of Agriculture show that the Rio Grande River near its source in Colorado and New Mexico contains less than 100 parts per million of total salts; yet through use and reuse of this river water as it flows downstream, it has picked up over 2,000 p.p.m. of salts before it reaches its final destination in Texas.

Wherever irrigation water is applied to the land, plant growth and evaporation use up the water, leaving most of the salts contained in this water on the land. Each application of additional irrigation water adds more salt to the feeder root area of the soil. Winter rains

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WATER NEEDS in

Indian Water Needs

By LESTER OLIVER

*Tribal Representative
White Mountain Apache Tribe
Whiteriver, Arizona*

THE water needs of the Indian are no different from the water needs of non-Indians. As the Indian has become more and more civilized, his needs for water, like the white man's, have increased and are still increasing.

On the Fort Apache Indian Reservation, the greatest need for water at the present time, economically speaking, is in the field of recreation, followed in importance by the need for water to sustain the cattle-raising industry, and of last importance, for agriculture.

The reason for my categorizing our needs in this order is that most of the needed stock tanks have been built and the irrigation diversions made on our reservation, and while this order of importance by the need for water does not apply to many of the other Indian reser-

vations of the state of Arizona, it is becoming well-recognized that the White Mountain area, in which the Fort Apache Indian Reservation is located, contains the greatest fishing and hunting potential in the entire state.

I do not wish to create the impression that there is not still a great deal of irrigable land that could be developed; however, this is an uphill battle for the Indians because of the lack of appropriated funds and because of the pressures applied by outside interests.

In our state an unusual situation exists in that the need for the development of the White Mountain recreation area is equally as important to the state of Arizona as it is to the tribe. For example, Arizona has an estimated population of one million people, and of these one mil-

lion, two hundred fifty thousand are anglers who fish an average of $9\frac{1}{2}$ days a year. Each spends approximately \$10 per day, or a total business volume of \$23,750,000 per year. This is a conservative estimate which, of course, does not include non-resident use.

Good trout lakes in Arizona are capable of producing one hundred pounds of trout to the creel annually for each acre of surface area, and this figure is sometimes exceeded by 100 per cent. One pound of trout fish will supply an adequate man-day of fishing. One acre will supply one hundred man-days of effort of acceptable angling on the trout lakes of the White Mountains. A lake containing 100 surface acres can create 10,000 man-days of angling at \$10 per man-day, or \$100,000 of business per one hundred acres. The \$10 per day includes gasoline, travel expenses, food, lodging, boats, tackle, etc.

One can see that this not only directly but indirectly is beneficial to the economy of the state of Arizona. It would be extremely difficult to cite such profitable use of water for any other purpose, and I have not included the intangible value of relaxation derived from fishing, or the number of general recreationists drawn to an area by water development who do not themselves fish.

For instance, a party of five usually contains an average of only three anglers; therefore, unless provision is made to provide economically for adequate fishing in Arizona, anglers will seek summer recreation elsewhere, with a resultant business loss not only to the tribe but also to the state's economy.

The Apaches realize that their predecessors met their water problems head on rather than quit their place of abode and industry. The ancient wells, aqueducts and reservoirs of the old world, some still serviceable after thousands of years, attest to the capacity for constructive thinking and cooperative ventures which had a part in human advancement.

The White Mountain Apaches met their water development program head on when they recently constructed the Smith Park Dam. The building of this dam almost provoked bloodshed, but now

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Dr. Harold E. Myers (seated) was moderator of a panel which included, from left, Edward P. Stamm, George V. Christie, Lester Oliver, Leland Hover



S in the SOUTHWEST



Standing on a dike at Frank Appleton Farm, Sahaurita, Ariz., group viewed soil conservation practices. They learned that cotton, cattle, copper and "climate" are Arizona's principal products

■ Agricultural Water Needs

By GEORGE V. CHRISTIE

*Vice President
First National Bank
Phoenix, Arizona*

ANY discussion of this subject must have boundaries, and I would limit them to Arizona, generally, and to the Southwest in toto. Of course, basics will apply not only to the whole southwestern section of the nation but specifically to Arizona.

We must recognize that irrigated lands in Arizona are not exclusively used for the growing of price-supported commodities. It is of interest to note that 87 per cent of the price-supported commodities are comprised of 30 per cent wheat, 29 per cent corn, 20 per cent upland cotton, and 8 per cent tobacco.

Irrigated lands which actually are part of numerous reclamation projects do not supply tobacco. Upland cotton is raised on irrigated land, as is American-Egyptian, though the latter is on very small acreage. The amount of wheat raised on irrigated lands of reclamation projects is less than two per cent of the total price-supported commodities and corn is only .4 of one per cent.

We grant that these staples are necessities, but point out that the products of irrigated lands are heaviest contributors to a well-rounded and healthful American diet which includes lettuce, carrots, tomatoes, celery, citrus fruits, grapes,

alfalfa, and many others. For example, 89 per cent of all the lettuce in the United States is grown on irrigated land; namely, in the Southwest. That lettuce reaches its markets while the northern states are still snowed in. Plums, apricots, peaches, and olives are products of irrigated areas. And here are some percentages of other commodities which sound almost fantastic: grapes, 95 per cent; plums, 87 per cent; sweet cherries, 85 per cent; cantaloupes, 83 per cent.

None of these is a price-supported commodity, and there is never a surplus.

Our boundaries for this subject are now established. The question is, what are agriculture's needs for irrigation? Bearing in mind that it takes about 5 acre-feet to raise a crop of cotton and 3½ acre-feet for alfalfa, we need to look at quality as well as quantity. It is a matter of pride that Arizona's cotton farmers, against a 1957 national average of .4 bales per acre, average nearly 2-1/5 bales. Whereas elsewhere farmers are happy to have two, or with luck three, cuts of alfalfa per season, Arizona farmers have five or six. Absence of rain in the central Arizona regions makes irrigation vitally necessary. Because of the intricate series of canals and waterways which experience and engineering

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Soil Conservation Service men who led the discussion at the Appleton Farm, described treatment for the four soil types



This Forest Service team keeps the management wheels turning on the Coronado (left, front row) Arthur Foster, Chuck Ames, Supervisor Norman Weeden, Ken Sahlin, Harold Harper; (back row) Frank Johnson, Ed Carr, Bob Schmitt, Ed Cottam, John Waters, and Marshall Wright.



Urban Water Needs

By LELAND M. HOVER

Advertising Manager
Phoenix Republic and Gazette

YOUR invitation, as issued so beautifully by Chief Forester Kenneth B. Pomeroy way back last February, was such an honor that I will now frankly admit that I accepted with too much alacrity and not enough perspicacity. In other words I said "yes" without knowing anything about the subject!

This, according to the program, is your *eighty-third annual conference*.

Regional Forester Fred H. Kennedy (r.) was the recipient of the Indian Fire Pump, presented by Kenneth Pomeroy



You started considering some of these problems *thirty years* before I was born! Knowing this as I do, I am hoping that you will accept my remarks in the attitude in which they are made—humbly, not as a recognized expert, only as a very interested layman.

As I have listened to some of the subjects under discussion, and in studying the program, noting other important phases of forest management that, unfortunately for me, I have missed hearing my own topic reminds me somewhat of the young lad up in the hills who fell in love for the first time. He had it bad, and finally he went to his dad and said, "Paw, I'm in love and I want to get married." His dad asked him who the girl was, and when the boy told him her name, Paw said, "Son, you can't marry her, she's yore half-sister." Well, that just about broke the boy's heart, but eventually he got over it and met up with another gal and fell harder than the first time. Came the day when he went to Paw again and the same story—she, too, was his half-sister. After three or four more almost exactly similar experiences, the lad had about run out of prospects in them thar hills and finally, on the last one, he went to his Ma and told her his troubles. She listened to his story and

then said, "Son, you don't need to pay him no never mind no how, he ain't no kin o' yours!"

Foresters, professional, non-professional or just visitors here, don't let "Paw" or "Ma" either one fool you . . . the urban and industrial water needs of the Southwest are very definitely "kin o' yours!" In the electronic and air power age which we are entering, the development of the entire Southwest area, with its clear skies and almost continuous flying weather, is of vital importance to the future of our country.

Water has always been our great limiting factor. It has limited our agriculture, our cattlemen, our industrial development, our mining, our lumbering—particularly pulp products; it has stifled development of home-building in certain areas, and overtaxed our recreational facilities in every area within easy access of population centers.

Water, according to historians and archaeologists, was the limiting factor here long before Columbus ever saw this continent, some 466 years ago! Deep well pumping and storage reservoirs for surface flow have given us some advantages over those ancient peoples, but there is no doubt that our modern living requirements per capita are multiples of theirs. No doubt our transmission and delivery systems are more efficient and less wasteful, but I'm afraid we haven't shown much improvement in the basic fundamental of *production*. We are still dependent on rain and snow—and, as yet, have not had much to say as to when, where, and how we get it!

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■ Research in Watershed Management

IN his keynote address, Dr. McArdle told the AFA convention that "you can't push nature around" for very long and get away with it. To some, this statement was strongly reminiscent of the famous Leopold definition of conservation when he said, "Conservation is a state of harmony between men and land. By land is meant all the things on, over, or in the earth. Harmony with land is like harmony with a friend: you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and waste the ranges; you cannot build the forest and mine the farm. The land is one organism. Its parts, like our own parts, compete with each other and cooperate with each other. The competitions are as much a part of the inner workings as the cooperations. You can regulate them—cautiously—but not abolish them."

What water users in Arizona are talking about is a greater degree of regulation based on exact research that provides the right answers before people do the wrong things. The key word in the Leopold dictum, so far as the Arizona situation is concerned, would appear to be the word "cautiously," and at least two research technicians on the program—Raymond Price, of the Rocky Mountain Forest Experiment Station, and Dr. R. R. Humphrey, of the University of Arizona—indicated rather thoroughly that caution is indeed the watchword on Arizona water research, and that the professionals will not be stampeded into any ill-advised course of action in the name of expediency.

Speaking in terms as non-technical as possible for a predominantly lay audience, these men showed slides and gave examples of the types of experiments that have been done and are being done on the growth of ponderosa pine and other types: how science is endeavoring to manage these trees in a manner that will assure maximum growth and at the same time provide adequate water runoff; how to produce more forage for range animals; in short, how to run a balanced multiple-use program that will meet the needs of the land and the greatest number of people in a manner justified by sound research.

The fact that they do not yet have the answers to many of these questions was brought out time and time again by both of these speakers as well as other participants on the program. They were frank to admit what they didn't know. At the same time, they warned their lay audience time and again "not to gen-

eralize" regarding these unknown quantities, to avoid repeating old-wives' tales not borne out by scientific truths—and, in short, to look at the facts before leaping to the conclusions.

The array of tests now going on in Arizona on such things as quite drastic ponderosa pine thinning experiments, and juniper removal on what, to a layman at least, might seem to be a rather wide scale, were all described by these scientists and illustrated with pictures. Their very frankness must indeed be considered as a compliment to what they consider the good sense of a predominantly lay group. What they seemed to be saying over and over was, "We don't know if these things will work or not, but we're scientists and it is our job to probe new ideas, meet current needs, move forward with the times, and look to the future." Or, to paraphrase Tennyson as quoted in the new brochure "A Half Century of Research" by the Rocky Mountain Range and Experiment Station, "All research is an arch wherethrough gleams that untraveled world, whose margins fade forever and forever as we move."

Or, as another speaker stated at Tucson, "We live in a fantastic era of research. Who ever dreamed only a few brief years ago that we would be putting moons into orbit?"

Just the same, it was a pretty big dose the AFA audience was exposed to at Tucson. That the professionals are proceeding "cautiously" was a source of relief, but the questions flowed at Tucson and continue to flow since everyone went home. For it was here that many of them learned that research is the place where the buck passing stops, and they were exposed, some of them for the first time, to such matters as deforestation as a tool in watershed management, and fire as a tool in watershed management.

Some of these problems are things that *American Forests* itself has done very little about, although it has been inquiring into them rather carefully; but here at Tucson members were asking, "Is the destruction of forest floor cover and humus justified as a tool of forest management?"

This had to do with the question of "fire as a tool" in clearing out thick understories, giving the bigger trees more of a chance. Mr. Price replied, "We're testing it. There's lots of speculation. We've all experienced the results of wildfire, so we are fully cognizant of the potential dangers. Again, it is a question of whether you can control the tool. In some parts of the South it has been used successfully. Competent professionals have

had cool fires that have reduced the groundcover fuels which build up when areas are kept free from big fires. It probably boils down to this: There are places where you can burn to advantage."

"Is wildlife protected, and are song birds considered in these considerations?" another member asked.

"On the national forests, we have technicians from the Fish and Wildlife Service who work very closely with us on these matters," Mr. Price replied. "There are problems, of course. When we take oaks out of pine stands, turkeys are involved, for turkeys eat acorns."

In this connection, and speaking of prescribed burns, it was interesting to note some months ago on the Francis Marion National Forest in South Carolina that the "cool" burns—in this case burns by the wildlife manager after sundown—seemed to aid the turkey population. The birds actually seemed to sense the difference between a slow fire and a wildfire; they left the woods and paraded unconcernedly up and down the highway as the "cool" fire trickled through the forest understory. There is no question that cool fires work—at least in this one area, when handled by trained professional foresters and wildlife technicians.

"In reference to tests in converting spruce-fir types to grass, won't they revert back?" another member asked. To which Dr. Humphrey replied that they will tend to, since they are climax species—which is particularly true of the spruce-fir zone.

"What's to be gained for water runoff in working with spruce-fir, when there is so little of it in Arizona?" another member asked. "That's true," Mr. Price replied, "but remember the spruce-fir here is where the water falls in most quantity, so it is appropriate to research the problem and find the answers."

Finding the answers—that, in general, was the theme of this Arizona meeting. The trained professionals are proceeding "cautiously," with research in the saddle. And isn't that what Point III of AFA's Program for American Forestry stresses? The goal, the program sets forth, is to "obtain the maximum economic and social services from our forests by realistic application of the principle of multiple use in their management. This should include all forest uses and services, but must give great weight to national requirements in conservation of water and control of erosion."

That would seem to be what this Arizona water program is all about. (J.B.C.)

■ Forests, Recreation, Wildlife, and Water

THE panel members who preceded me have done an excellent job in explaining the water needs in the Southwest for agriculture, urban areas, and range forage production. They have also covered the fields of research in watershed management and the needs of our original Americans, the Indians. I will confine my remarks today to water and its relationship with other forest resources or uses on the national forests here in the Southwest. Most of the water available to Arizona and New Mexico falls to earth on national forest lands, and this puts the Forest Service very much in the water business. But it's not our only business, as you all know. My job today is to show you that managing the national forests is a more complex business than managing any one of the forest resources alone. Perhaps the best way to do this is first to tell you something about each of these forest resources on the national forests and what they are worth to the people of the Southwest. I'll start with timber.

Most of the ponderosa pine areas in these states—Region Three as we call them in the Forest Service—have been cut over once on a tree-selection basis. We are just getting a good start in the harvesting program for the majority of the spruce-fir timber at the higher elevations. Of the estimated annual allowable cut for all saw timber species on the national forests—366 million board feet—over 300 million was cut during 1956. We hope to be able soon to harvest the entire allowable cut on all national forests in the region. The total harvested in 1956 had a value on the stump of close to three million dollars. The sawmills processing this material, some 200 in the two states, employ about 4800 workers in the mills and woods, and a large number of workers are also employed in transportation and manufacture of finished wood products. The national forests in the region supply about 63 per cent of the timber used by these mills. The present market value of timber products from all forest lands in the region is estimated to be \$33 million a year f.o.b. at the mill.

Recently a sale was made by the Forest Service of six million cords of pulp material which involved six national forests in the region. It is planned by the purchaser to construct a 30 to 50 million dollar pulp plant at Snowflake, Arizona. The material to be processed in

By FRED H. KENNEDY

Regional Forester

Forest Service

Albuquerque, New Mexico

this plant will consist largely of ponderosa pine thinnings, mill waste, and timber residue now being left in the woods from saw log operations. The thinning in both the ponderosa pine and other timber types will improve the growing conditions and make it possible to utilize thousands of tons of wood now being totally wasted. This one venture will employ an additional 200 people. So you can see that the timber resource in the Southwest is an important economic asset to an industry-short area.

Another important resource of the forest is recreation. About 30 years ago the road into Oak Creek Canyon on the Coconino National Forest was improved, causing a big increase in use. The local ranger stated there were 400 recreation visitors that year. He predicted recreation use might double in five years because of road improvement. In 1957 approximately 200,000 people—a 500-fold increase over 30 years ago—visited and used the campgrounds in Oak Creek Canyon. The increase in use of the recreation areas on the national forests is keeping pace with our rapidly increasing population in this fastest-growing corner of the nation. In 1947 about one million visits were made to the camp and picnic areas in the 12 national forests of Region Three. In 1957 this had increased to five million visits, and it is our estimate that by 1960 it will be six million visits and by 1965 close to eight million visits a year. Arizona in 1910 had around 200,000 people; today it has almost six times that number and is still growing. New Mexico has not yet reached the one million mark, but at the rate it is growing this won't take long.

The higher, cooler mountain areas of the region are thus at very much of a premium during the hot summer months—not only for the people of Arizona and New Mexico, but for neighboring states as well. These mountain areas not only give relief from the heat, but provide outdoor recreation which is enjoyed by most Americans. In the past ten years the number of summer home residences in the national forests here has doubled. There are over 1300 of these residences at the present time. This number could

be increased many times if there were room to take care of the demand. Again, it is easy to see that the national forests in the Southwest are extremely important in providing outdoor recreation opportunities for an expanding American people.

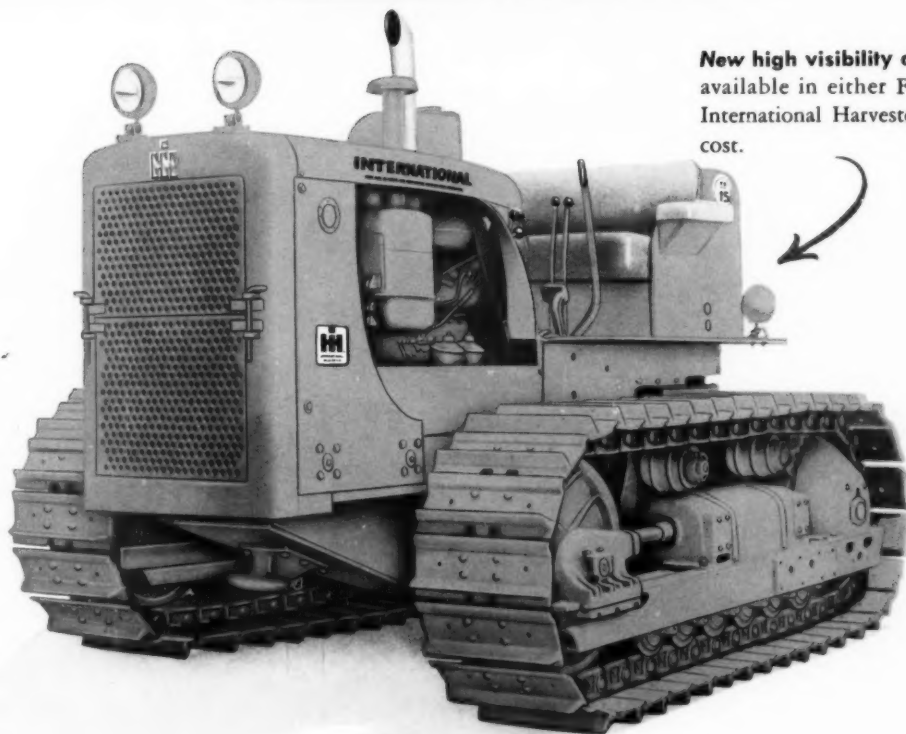
As to hunting and fishing, the most popular of our sports, the national forests provide the bulk of the big game habitat and a substantial part of the region's trout fishing. In 1957 approximately 46,000 big game animals were harvested in the southwestern national forests, the majority of these animals being deer. Other big game animals of importance are elk, antelope and javelinas. Most of the forests also have a good population of wild turkeys; 200,000 hunter visits were made in harvesting this game. There were almost 500,000 fishermen visits to the national forests during 1957. Sixty-five lakes ranging in size from several acres to several thousand acres have been artificially developed, many of them by the game and fish departments on the national forests in the region. Some of these are being managed primarily for fishing. In addition, there are some 2000 miles of fishing streams. It is rather obvious that the national forests and their management are very important to the hunter and fisherman in the Southwest.

Although Dr. Humphrey has fully and capably covered forage production in his presentation, I'd like to say a word or two about the importance of the national forests to the livestock industry. In 1957, over 220,000 cattle and 147,000 sheep were grazed on the national forests of the Southwest by about 3,000 ranchers. These livestock make up about 11 per cent of the total produced in Arizona and New Mexico. This is another important forest use.

In discussing water, I'd like to refer to the large map of Arizona and New Mexico displayed here to give you a rough idea of the size and scope of the vegetative zones in the region. The map shows the national forests outlined with a heavy black line, and in color the major vegetation types of the mountainous areas—basically a measure of the rain or snowfall in each elevation. As you will note, starting at the higher elevations the mixed spruce, fir, aspen, and subalpine types are shown in blue, with an average of about 30 inches of precipitation a year. Below this is the ponderosa

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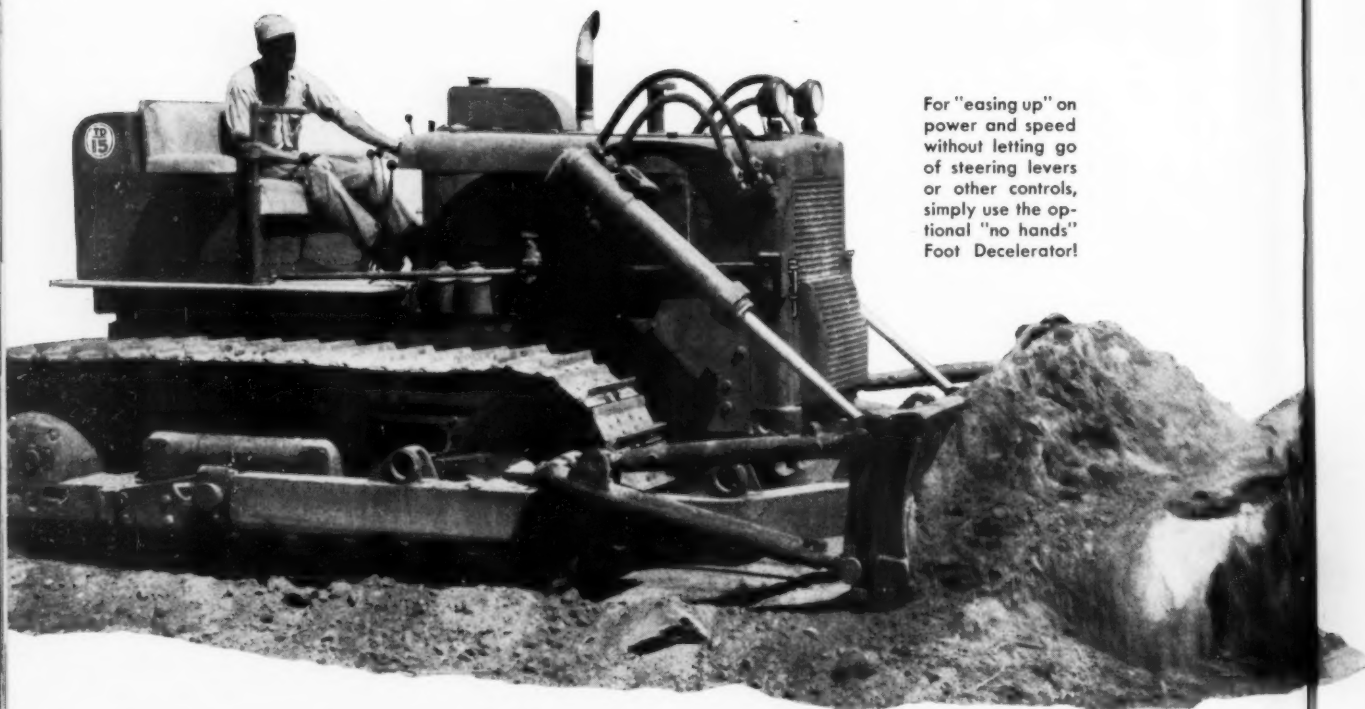
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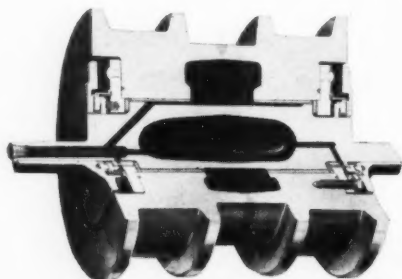
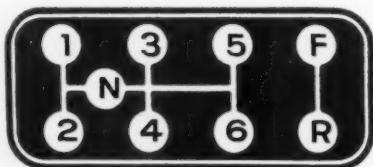
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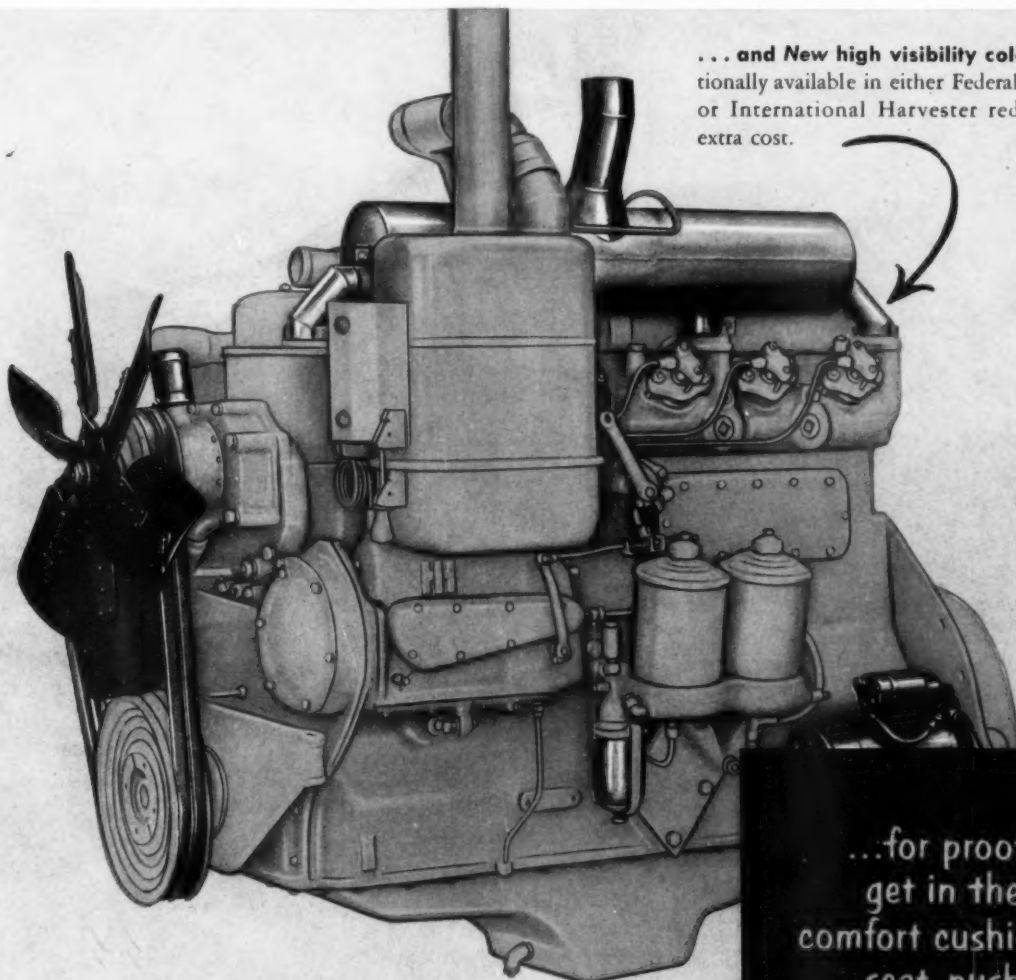
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pine zone in green, getting 20 to 25 inches or so annually. Surrounding that, the piñon, juniper and chaparral areas are lumped together as yellow, with a 10-15 inch annual rainfall. The high, wet grassland areas have been included with the dominant timber types, but the low-level, dry rangeland and desert shrub areas within the national forests have been left white. Of the 20 million or so acres of national forest land in the Southwest, one million are in the blue or spruce-fir type, almost five million are in the green or ponderosa pine type, and 14 million are in all other types including woodland, chaparral, desert shrub, and low-elevation grassland. You may be wondering what those strips of orange are doing running down the major river drainages of the two states, mostly outside the national forests. Those indicate the main irrigated lands of Arizona and New Mexico, the ones most concerned with water from the mountains. Now if the forest plant cover is to be manipulated to increase water yield, then the areas where this could most likely be accomplished would be the spruce-fir zone and the ponderosa pine zone, the blue and the green, respectively. At least from the water production angle, these are the areas which show the greatest promise. As indicated by Director Ray Price, this assumption is supported by research findings developed in other areas in the West for these two vegetative zones. I might point out here, however, that increased stream flow brought about by watershed treatment high in the mountains may not necessarily bring more water to the valley floor for crops, industry, or domestic use. Hundreds of miles of thirsty streambeds may swallow up whatever increase we cultivate in the high country unless improved means of transporting the water to the lowlands are devised. It is estimated, for example, that 50 to 75 per cent of the flow in our desert rivers never gets used by man, but disappears in streambeds, seepage, rampant streamside vegetation, and other losses.

However, on the assumption that the spruce-fir and ponderosa pine can be managed to yield more usable water, let's take a look at these areas from the viewpoint of the other resources. The ponderosa pine and spruce-fir types above make up only about 30 per cent of the total area of the national forests in the southwestern region, but they provide most of the resources for the bulk of the users. As to water, the pine zone and higher areas average twice as much water per acre as the lower elevation woodland and chaparral, and at least three times as much per acre as the surrounding desert. At the same time, the pine and up areas provide practically 100 per cent of the timber production,

85 per cent of the recreation visits, 65 per cent of the big game harvest, 65 per cent of the fishing use, and 33 per cent of the livestock use on the national forests. It is therefore quite obvious that the area which might produce or yield more water through changes in management is also the area supporting most of the forest uses in the region.

All of the other uses or resources require water. Timber needs water for growth of trees and for log ponds for the 200 mills in the region; and I am told that the proposed pulp project at Snowflake will need at least ten million gallons per day to operate its plant. We are already experiencing difficulty with the health authorities in attempting to supply water for the present recreation load. Our efforts to date are far short of an acceptable standard. I hesitate to think of the future as far as this problem is concerned. The fishing resource cannot exist without water; and to maintain proper temperatures on many of our streams here in the Southwest, shade provided by trees is a must. Both big game and livestock require water. The 3600 or so water developments emphasize this, one-third of these being in the much-desired pine and spruce-fir zones. In effect, most of the forest uses are in competition among themselves for water,

and when the bulk of them are concentrated on 30 per cent of the area of the forests, any effort to increase the yield for "off site" purposes is going to require some skillful management, to say nothing of diplomacy.

Now, just what does this all mean in the management of the national forests in the Southwest? The original charter for their management, an act of Congress of June 4, 1897, provided that the national forests would be managed to secure favorable water flows and to produce a continuous supply of timber for the people of the United States. When the national forest system was established by Theodore Roosevelt, he saw to it that the policy would be that the national forests would be managed for the greatest good of the greatest number of the people in the long run. This policy is still in effect today. These directives for the management of the national forests, topped off with the fact that water is probably the most important resource for the development, enjoyment, and survival of the Southwest, mean that somehow it will be necessary to apply the multiple use concept and still get the best water yield possible from the lands.

As explained by Ray Price, if we had more of the answers on the many inter-

(Turn to page 51)

SMOKEY BEAR HAS HIS DAY



SMOKEY BEAR (shown above saying "Howdy" to President Don P. Johnston) had his day in Tucson. After safely bringing in AFA's Conservation Caravan and greeting school children

along the way, Smokey unveiled the blowup of the Forest Conservation Stamp and served as a sort of ringmaster for the pageant at which users of the forest saluted this symbol of "wise use." First came a lumberjack (John Bennett) who rested on his axe for a moment and then waved his hand in salute. Boy Scouts from the Tucson Council next appeared (Bob Standish, Dave Smith and Gerald Hughes) and smartly saluted. A lady fisherman (Mrs. Inez York) next marched by the stamp, throwing it a kiss as she passed. A cowboy (Bud Whalen) carrying his saddle came next and paid his tribute to the illuminated picture. Finally, came the prospector (John Brinkley) with his burro. Pausing, he took a long drink of water from his canteen, replaced it on the burro, and with closed hands held aloft saluted the big forest scene. The audience stood and applauded.



Among guests were (l.) Mr. and Mrs. Hermann Krauch, Mrs. Paul Pitchlynn, Dr. and Mrs. Samuel Dana, Toastmaster Kellogg

Old Timers

THE word "retirement" is something of a myth so far as foresters are concerned, if the early foresters who turned up at Tucson last month are any indication.

If the special luncheon for "old timers" staged by AFA proved anything, it was that most of these individuals are still actively and profitably engaged in furthering the objectives of their chosen line of work—forest conservation.

Take Toastmaster Royal S. Kellogg for example. Mr. and Mrs. Kellogg travelled from their home in Palmetto, Florida, to board the Tucson-bound Conservation Caravan at Chicago. After chairing the luncheon, making all the field trips and participating in all the discussions, the Kelloggs hurried back to Florida to get there in time for the dedication of Kellogg Park, east of Oneco. This park, as dedicated by State Forester C. H. Coulter, honors the many contributions of Mr. Kellogg to Florida forestry, just in recent years.

In making the principal address at the "Old Timers" luncheon, Mr. Kellogg said, "We're never going to have a timber famine in the United

States. That was assured when the price of timber got up to where it was worth something. There are now over 16,000 foresters in this country, and the big recent progress is in industry, where it belongs. And if you think I'm talking free enterprise here, you are absolutely right."

Mr. Kellogg's most recent contribution to Florida forestry has been writing articles and making talks helping to obtain weather recording instruments to help the Weather Bureau more accurately predict fire danger signals. In acknowledging the new park on November 16, Mr. Kellogg said it was an attractive park and he hoped it would soon be enlarged.

Another early forester spotted in the audience was Christopher M. Granger, former Assistant Chief of the Forest Service, who is generally credited with being the first administrator of national forests timber to put those operations in the black—which means that those operations now pay their own way and more.

James Stevens, of Seattle, Washington, was spotted at another table. Mr. Stevens, of course, was the sergeant of all work for the late Wil-

liam B. Greeley at the West Coast Lumbermen's Association. Stevens' latest book, *Green Power*, is now coming off the press of the Superior Publishing Company in Seattle. It is the story of Public Law 273 and is dedicated to the memory of Col. Greeley.

Samuel T. Dana, former Dean of the School of Natural Resources at the University of Michigan, is another early forester who is sometimes jokingly referred to as being retired. Since his retirement, Dr. Dana has made a recreation study for the Forest Service, two land ownership studies for The American Forestry Association, and was only recently named to the new Outdoor Recreation Resources Review Commission appointed by President Eisenhower.

President Don P. Johnston, of AFA, whose visit to Tucson was in the nature of a homecoming for him, this summer was personally honored by President Eisenhower for his work in helping to reduce the incidence of forest fires in the South.

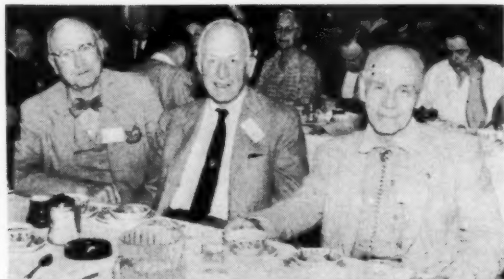
H. H. Chapman, of New Haven, Conn., at the speaker's table at the luncheon, was referred to by Toastmaster Kellogg.

(Turn to page 63)

(Left) AFA staff member Leslie Hunt, Mr. George Drake, Mr. and Mrs. James Stevens, enjoyed luncheon



An international table, hosted by Dr. Wilson Compton, AFA vice president, was composed of guests from eight nations



C. L. Hassinger (left), oldest active conservationist at luncheon, with A. B. Rechnagel, and Harry E. Dobbins



Toastmaster Royal S. Kellogg and his wife, who live in Palmetto, Florida, traveled to Tucson via the Caravan

Other "old timers" at the luncheon included Major Kelly (right) seated next to Mr. and Mrs. Christopher Granger. Mr. Granger is a former asst. chief of Forest Service



Wolfgang Koehler (r.), forestry attache at German Embassy in Washington, went on a shopping spree in Nogales with Mr. and Mrs. Pomeroy

AFA Executive Vice President Fred E. Hornaday and Mrs. Hornaday, enjoyed touring the Nogales shops, and were pleased with the bargains



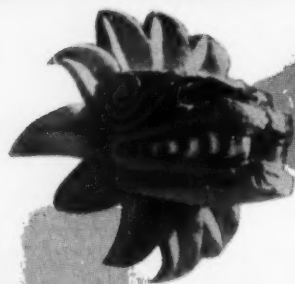
AFA in Mexico

WITH appetites whetted for enchiladas, and the prospect of trying their skill as Yankee traders, AFA conventioners converged on Nogales, Mexico, at the conclusion of the annual meeting in Tucson. However, at the end of the trip, it was obvious to all that the Mexican merchants had been rubbing their hands together in anticipation of the group's arrival.

The first clue that we, and our Yankee dollars, were more than wel-

come to this quaint border town, came when the group reached the border patrol station. Instead of being stopped and questioned, a nattily attired Mexican border guard, with a most ornate silver-handled revolver protruding conspicuously from his holster, gallantly waved us through the station.

However, on arrival the consensus was that we would be able to deal with the merchants more adroitly if we first sampled some typical Mexi-



The Cave, where AFA members dined in Nogales, had Troubadors to entertain guests



can foods, so we headed for the Cave, or "the best Nogales has to offer." This picturesque restaurant, which was originally a gold mine, and then a jail, has its rough hewn walls splattered with gold paint, giving one the notion that the owner, a Greek, still considers it a gold mine. Everyone enjoyed the savory Mexican dishes served at the Cave, particularly when they were accompanied by the singing Troubadors.

Immediately after lunch, AFA members eagerly proceeded to the shopping areas to try their luck at the amusing game of haggling with the merchants, and the merchants were waiting for them, in their gaily painted shops. We found these shops particularly interesting, in that whether they were clean and modern or grubby stalls, the merchandise offered was practically identical.

The merchandise in these shops

was really tempting—exquisite silver goblets of all sizes, jewelry, leather goods, and Indian blankets, all reportedly hand made. The prices, surprisingly, were quite reasonable, but we couldn't resist the opportunity to try our hand at bargaining.

The object of our search was a "better price" on goblets and blankets. We toured dozens of shops before we caught on to the trading trick, buying in quantity. We discovered this fact when one enterprising merchant answered our price query with, "Well, how many would you be wanting?" When told we would be interested in a dozen goblets, the clerk scurried behind the counter, held a hasty whispered conference with his partner, and then offered us the set for 25 per cent less than the marked price. Incidentally, the same maneuver reduced the price of the blankets considerably.

Perhaps the best time to haggle

with these merchants, we found, was toward the end of the day. Typical of merchants throughout the world, their prices come down more quickly when it's near closing time. As we were about to depart, two silver bracelets caught our eye, but we were slightly taken aback when told the price. Noting the customer's reluctance and growing disgust, the merchant quickly said, "You can have the two for the price of one." We consider that transaction our supreme achievement in Nogales.

Conversation on the trip back to Tucson that evening centered on the trading exploits of the group. We are sure a few "fish stories" were tossed in to spice up some adventure tales, but everyone seemed delighted with his "bargains." However, we are quite certain that the Mexican merchants were just as pleased with their American dollars as we were with our Mexican silver. (B. K.)

Reading About Resources

(From page 5)

reversed, were themselves used by resources.

The sea and the sky, and the heat and the rain and the storms that come from them, are greater resources than we are accustomed to considering. They have a power about them which no forest possesses. They have an eternal quality which we do not know in our declining oil fields. They are resources nonetheless. And that is the point.

Men need to be put in their place

from time to time, reasonably humbled to human stature—and the sea can do this like no other resource can. **The Outer Banks** is a chronicle of just that experience: of men being humbled, but also of men rising to fight again and again. The Banks, until the tourists came in recent years, were hard and unyielding, where no aspect of life was easy and the elements of nature were a sworn enemy.

Whenever we find ourselves con-

gratulating one another upon our mastery of nature, and admiring our exploitation of America's wealth, it would do us good to pick up a book like **The Outer Banks**, to discover again how much men can live without, to see how many men have made homes for themselves where there was only a little sand and a great, angry sea. Reading such a book, one has the faint suspicion that we may be softer than we would like to admit.

AFA Awards for Distinguished Service

(From page 8)

education. "... He has been a pioneer in the field of range research, and indeed is regarded by many as the father of our present-day science and art of range management ... established and was the director of the first forest experiment station in the country devoted entirely to range problems ... He passed along his

scientific findings to hundreds of students ... and founded the first school of range management."

Clarence M. Malone, Vice Chairman of the Board, Bank of the Southwest, Houston, Texas. Award in the field of general service. "The Texan selected has been a catalytic agent in sparkplugging active in-

terest in soil, water, and forest conservation, in the entire nation ... he has recruited to the cause of conservation a small army of actively-interested people ranging from corporation presidents to dirt farmers. He helped organize the Conservation Committee of the NAM ... carried his campaign to Texas schools. ..."

Progress on Minnesota Land Study

(From page 1)

four state forests, plus large areas of county and private forests. In eight state forests less than 10 per cent of the area is in state ownership.

State forests contain a bewildering variety of different kinds of land.

These include four categories of trust-fund lands (school lands, university lands, swamplands, and internal improvement lands), "conservation area" lands, and lands acquired by gift, purchase, and transfer from the counties. Accounting for

the receipts from these different kinds of lands is a cumbersome and expensive process.

Consolidation of ownership by purchase or exchange is a slow and difficult process. Land for national forests can be acquired only within

areas designated by the state, and purchase of specific tracts must be approved by the county concerned.

Land within state forests can not be sold. Exchanges of state and county lands are impossible. All exchanges involving state or county lands must be approved by a state Land Exchange Commission, consisting of the governor, the attorney general, and the state auditor.

Facts such as these raise many questions. Is the present, essentially unplanned division of ownership between private, county, state, and federal agencies satisfactory? If not, what changes are desirable, and how can they be effected?

Would larger industrial holdings of forest lands increase economic stability? What combination of farm and forest land constitutes a satisfac-

tory economic unit in the northern counties? What can be done to improve the management of the large number of small woodlots in all parts of the state?

What is the relationship between taxation, forest management, and the cost of essential public services? How is this relationship affected by special tax laws (such as the auxiliary forest and growth-tax laws) and by state aids of various kinds?

To what extent, and where, is consolidation of ownership desirable? How can the exchange process be speeded up (including assurance of the merchantability of tax titles)?

Can the number of different kinds of state lands and trust funds be reduced, and accounting procedures connected with them simplified? To what extent should the receipts from

state and county lands be made available for their management?

Samples of problems in related fields are the relation between recreation and timber utilization, the place of "wilderness areas" in the picture, and the conflict between waterfowl production and the drainage of potholes.

The final report on the study, which is now in preparation, will present and analyze the basic facts relating to land ownership in Minnesota, and will discuss the problems to which they give rise, with suggestions as to possible solutions. The first draft will be distributed for criticism among the many individuals who have cooperated in the study, and will be subsequently discussed at a public meeting to be held for that purpose.

Ambassador Sounds International Note

(From page 23)

"These things may take time," he said, "but suppose collective security as envisioned by the United Nations and the Organization of American States does take 50 years or more. Isn't peace the basic aim of mankind on this earth?"

The Annual Banquet was chaired by Tom Gill, Executive Director of the Charles Lathrop Pack Forestry

Foundation. The famous Tucson Arizona Boys Chorus, directed by Eduardo Caso, was given a standing ovation by the audience at the conclusion of a series of numbers, one of the most outstanding of which was "Cool Water." The boys, in their blue shirts, made a colorful picture as they stood before the Wendelin mural of the Forest Conservation

Stamp. In referring to their part in the program, Dr. Quintanilla, a poet of eminence, referred to them as Tucson's "Blue Angels."

Lloyd E. Partain, a Regional Vice President of The American Forestry Association and a member of the association's Awards Committee, presented the Distinguished Service Awards.

The Conservation Caravan—Arizona Bound

(From page 7)

of your necktie or look at the inside pocket of your suit or summer dress, you will probably find that it is made primarily from wood cellulose under the name of rayon or some similar trade designation.

Hurling along at a mile a minute, the Santa Fe Chief, which carried the caravan to the convention and return, passed over more than seven million wooden ties and by 150,000 wooden poles.

After a good breakfast, the caravan assembled at the Dearborn Station in Chicago, and at 9:10 A.M. we were on our way, Arizona bound. Making our way across the fertile prairies of Illinois, we could not but observe the bountiful harvest, particularly of corn ready to be picked and translated into food for man and beast. Some of the dirt farmers on board were amazed at the unending fields of ripening corn, in contrast to the smaller plots in the eastern states with which they were familiar.

At the 235-milepost out from Chicago, the Santa Fe Chief slows down and crosses the Father of

Waters. The great river is well-named, for if it assumed a vertical instead of a horizontal position it would resemble a giant forest tree. Its branches stretch from the Rocky Mountains to the Appalachians. The Missouri, Illinois, Ohio, Tennessee, and countless other rivers pour their effluence into the parent stream to make it the mighty river that it is. At its source in Lake Itasca in Minnesota, one can jump across the Mississippi without wetting his shoes, but at its mouth at New Orleans it is capable of floating the United States Navy. One of the river's tragedies is that it carries and deposits into the Gulf of Mexico the rich soil eroded from countless hillsides, together with pollution and waste from many industrial centers along its course. This has created a most serious problem for conservationists, nature lovers and marine engineers, but the river still is the bread-basket of America, supplying the homeland and our friends around the world with an abundance of food. If, through the magic

of science and technical skill possessed by our government, fresh waters from the Mississippi could be transported to water the thirsty desert land of Arizona and New Mexico, which we have seen on this pilgrimage, we could feed the entire world. Unfortunately, nature uses only a small percentage of its resources, and most of its power is unemployed. To distribute the waters of the world at the right time in the right places and in the right amounts is a project to tax the scientific ingenuity of man.

We crossed the Mississippi at Fort Madison, Iowa, the Missouri at Kansas City, Missouri, and many other rivers before reaching Lamy, New Mexico, where we detrained for an interesting side trip to the old city of Santa Fe and the land of the Pueblos. An hour's journey by motor bus brought us to the La Fonda Hotel in Santa Fe for breakfast. Here we had our first introduction to New Mexico and its people. We found it to be a most interesting state, three times the area of Ohio

and having a population of only six persons per square mile. Along with its neighboring state of Arizona, it was admitted to the Union in 1912. It is rich in history, steeped in the culture and romance of three civilizations — the Indian, the Spanish, and now the white man's civilization that flowed westward over the Santa Fe Trail.

When William the Conqueror was invading England, the Indians were in their golden age, which continued for more than 400 years. We were shown the ruins of many of their immense community dwellings, often containing as many as 1200 rooms. Some of these adobe apartments are still in use by the Indians, of whom there are more than 50,000 living within the state of New Mexico. The Navajo tribe follows its flocks over its reservation, which is as large as the state of Ohio. Its capital was settled in 1605, before any settlements were made in Massachusetts or Virginia.

Returning by motor bus through the Santo Domingo Indian country, we again boarded the Chief at Albuquerque, New Mexico. Albuquerque has an intriguing name, which to many is unpronounceable, and probably most high school students would be unable to spell it properly. Its name is probably derived from the Latin "alba," meaning white, and "quercus," meaning oak.

An overnight journey brought the caravan to the brink of the Grand Canyon. Here, overlooking the Canyon, we enjoyed breakfast. The weather was perfect, and a number of rainbows were seen in the Canyon. The greatest tribute to the Grand Canyon is paid by those whose words are never written, for it is a holy city and words cannot describe it. The Grand Canyon is the gift of many mountains. From the snows atop the Sierra Madres in Wyoming, from Pike's Peak in Colorado, from the high mountains of Utah and from a thousand forests and mountainsides, their waters come tumbling down to join the mighty Colorado, which throughout the ages has carved out the Grand Canyon.

We recommend to all readers an article by Johnreed Lauretzen entitled "A Path Made of Rainbow," published in the August 1947 issue of the *Arizona Highways*, which many believe to be America's finest pictorial magazine. It describes the Canyon as well as is humanly possible. It is the one spot in the United States which everyone should visit.

However, having visited the Canyon on previous occasions, the writer and Mrs. Smoyer left the train at Flagstaff, Arizona, engaged an automobile, and drove to Phoenix by way of the Oak Creek Canyon and Montezuma Castle.

Many travelers say that this is one of the finest drives in America, and we found it such. It is a friendly road, full of sunshine and turns. However, it is not made for speed. It loafs its way through the Canyon and the desert, and if you drive slowly, you will see jack rabbits, road runners, horned toads; or you may find a wren's nest built in a cholla cactus, as we did, a masterpiece of design and architecture. At lunchtime we built a fire of mesquite, and discovered that the delicate odor of mesquite wood mixed with the aroma of boiling coffee is really an experience in living, better than Duncan Hines can afford. It was a lazy afternoon, and then the shadows lengthened and the sun was gone, taking the shadows with it. The night stole over the desert. The stars took their places in the sky. The full moon came up, and peace settled over the desert landscape.

We rejoined the caravan at Phoenix, which is now a thriving industrial city of 300,000 and the capital of Arizona. The Chamber of Commerce claims Arizona to be the fastest growing state in the Union. It takes the name from the old Indian Arizonac tribe, which still has a village by that name in the neighboring state of Sonora, Mexico. Like New Mexico, Arizona has a Spanish background, and eleven of its twelve counties have Spanish names, Tucson being the county seat of Pima County.

We traveled by motor bus the 150 miles to Tucson, passing enroute the crumbling ruins of Casa Grande, more than 750 years old. In Tucson, we were comfortably quartered in the Pioneer Hotel, the convention headquarters.

It proved to be a very profitable gathering, the theme being, "Water, Forests, and People" — listed in the order of importance, although we were told that *air* is of still more vital importance. A detailed report of the background program will be found elsewhere in this issue. I should like to make a few observations about Arizona as I found and saw it.

The state has received much well-deserved publicity. It has scenery, much desert land, and very friendly people. Life is planned to keep peo-

ple outdoors, and the calendar was rearranged so that there would be no winter. Five minutes from Tucson and you are out miles from nowhere. There is plenty of room to go around and some to spare. Tucsonians have everything under the sun, and some think that they have too much sun. It gets mighty warm in the desert, the thermometer having climbed on one occasion to 127 degrees, as compared to the highest on earth of 136 degrees recorded in Libya, Africa. Climate depends, however, more on altitude than latitude, and when you get up around 4,000 feet you find as fine a summer climate as you could wish. One of the party remarked that the thing he would remember most about Arizona was how beautifully warm it could get in the sun in October, and how chilled one could get at night on the same day, or in the shade.

By the mere act of crossing the state line in Nogales, we were in old Mexico. It is an old and foreign land, and life there is strange and different. Its history can be read in adobe walls, dusty village streets, and pueblos where life has hardly changed in a century; but it is also new. Some of the ranchers use private planes to visit their cattle ranches, one of which we visited in the Sonora Mountains. With the overtones of Spain and the mixed culture of the races, it is a fine, friendly neighbor of a land whose well-being is tied so closely to our own.

Cattle, silver and leather seem to be the stock in trade, and we found one young man named Joaquin Hernandez, who has built up a flourishing business of jumping beans for tourists and United States export.

One of the hardships of Arizona is the problem of water, which to it is more precious than gold. A water hole is something worth fighting for. Civilization has always followed the springs and water holes and rivers, and whenever man has not had water he has perished.

As we passed by the cliff dwellings and adobe pueblos, we wondered what has become of the people who lived there, and were quickly told that they were the victims of lack of water. Drought is a cruel and tragic thing. Arizona is still thirsty, but much has been performed with the little water they have. Little wonder that the Indians always include in their prayers a prayer to the rain gods. At Phoenix, hard work, careful planning and water conservation

have vitalized the desert and have made it a garden spot, supplying much of the United States with its fruit and vegetables.

A serious problem to the agriculturist is the presence of salt accumulations. As they become more concentrated, they become increasingly more toxic to plant life. Directly related is the lowering of the water level, the ground water budget being out of balance. We were told that Arizona's most pressing problem is the finding of a source of additional water to supplement its meager supply. The annual rainfall of the state of Arizona is only about 10½ inches, although during the past year the rainfall has been considerably in excess of that.

The state tree of Arizona is the palo verde, and the state flower is the saguaro. The palo verde is a beautiful and unique tree. Its name signifies green pole, referring to the smooth green bark of its branches and trunk. It is sometimes called the Tree of Christ, because of the evergreen color of its trunk and branches. In the spring it bears a mass of yellow flowers. Its leaves are almost inconspicuous, which tends to emphasize its masses of pale golden flowers. Its wood is of poor grade and of little value. Its branches furnish emergency forage for livestock, its seed pods contain a highly nutritious bean, and from its flowers honey is obtained.

The giant saguaro cactus dominates the landscape of southern Arizona, its bloom being the state flower. A forest of about 65,000 acres has been set aside as the Saguaro National Monument, and a journey through the forest is a never-to-be-forgotten experience. It is devoid of foliage. The cactus is exceedingly

slow growing, many being 200 years old, and attains a maximum height of about forty feet, with outstretched arms giving it a grotesque appearance. It is an excellent subject for photography, and when portrayed in silhouette against the evening sky, it takes on a ghostly appearance like some fantastic creature from another world.

Arizona boasts more than 3,000 identifiable plants. To the uninitiated, it may appear like a giant cactus patch with other vegetation growing under desert conditions. The cholla, sometimes called the jumping cactus, is the enemy of all that touch it. To be appreciated, it should be observed from afar off. Close up, it becomes a devil's pitchfork, with burrs and claws like a cluster of hot fish hooks, attacking everything that it meets. One of the doctors on board examined a spine with the aid of a microscope and found it to be sharper than the finest needle.

Some of the members of the caravan were especially interested in the rock formations and brought back collections from the more than 3,000 species of colorful minerals. Perhaps nowhere in the world has Nature provided a wider variety. Turquoise, cinnabar, azurite, hematite are found in abundance, and many of the minerals are highly fluorescent. One of the group conducted a prospecting tour with the aid of an ultra-violet light.

Arizona is an ancient land, and it was not made in a hurry. To some of the building contractors on board, a thing of great interest was the technique of building construction with adobe used by the Indians centuries ago and still in good condition. Warm in winter and cool in

summer, it was eternal as the very sands of time; made from the good earth, durable, livable, and changeable to counter the moods of weather extremes. The adobe is fireproof and affords protection from the marauding and hostile enemies. A good example of adobe construction was left by the Papagos in the desert near Coolidge, in the form of an ancient apartment house, which is almost 1,000 years old and known as the Casa Grande National Monument.

This article would be prolonged beyond reasonable limits if I should attempt to describe many of the points of interest which were shown to us through the courtesy of the AFA. Outstanding were the many Indian villages, the old Pueblo cliff dwellings and mission churches, the Arizona-Sonora Desert Museum, the drive to the top of Mount Lemmon in the Coronado Forest—on which we were lifted to 6,000 feet above the desert floor—the University of Arizona, and a number of other most interesting places. A few of the group remained to enjoy more of the Arizona sunshine, but the rest of the caravan returned aboard special cars on the Southern Pacific Golden State Limited. We were pleased that the association selected the Southwest for its 83rd convention. We found it to be a land of enchantment and a photographer's paradise. The weather proved to be cool and invigorating.

There were a few inquisitors who were clawed by cactus, but no one was bitten by a rattlesnake, and none fell off a mountain cliff. We brought back some untanned faces and a lot of colorful Kodachromes, and above all a new appreciation of the problems of the newest addition to our national domain.

Arizona Watershed Program

(From page 25)

met and formed what is known as the Arizona Water Resources Committee.

This committee and the Watershed Management Division, headed by Joseph F. Arnold, a former forester, have since become the principal champions of and spokesmen for the watershed program.

The committee is unusual in a number of respects, some of which are worth exploring. A private, non-profit corporation, it operates on a very small budget, none of which comes from public funds. Aside from its president, Lewis W. Douglas,

former ambassador to Great Britain, and its secretary (the author), each of its directors represents a group with an economic or other interest in the product of the watershed. Farmers are represented by Victor I. Corbell, president of the Salt River Project; the logging industry by Pete Gaffney, a vice-president of Southwest Lumber Mills, Inc.; ranchers by Ernest Chilson, former president of the Cattle Growers' Association; mining by Jack Pullen, of the Phelps Dodge Corporation; municipal users of water by Jack Williams, Mayor of Phoenix; industrial users by George

Christie; banks by C. C. Cooper, Jr.; game and recreation by Jay Price, former regional forester; publications by Richmond Johnson, former editor of the *Arizona Farmer*.

Each director has an advisory group of four to twelve representatives of his particular industry or activity.

The first task of the Water Resources Committee was to make a fundamental decision: Would it promote the sweeping, sometimes controversial, recommendations of the Barr Report, or would it choose a more cautious approach?

The answer was a combination of both. Six of the recommendations of the Barr Report were adopted, *in principal*, with this important proviso: that each be evaluated in relatively small, field-test experiments before its adoption as a proven tool for management could be recommended.

Thus the Arizona Watershed Program, as it stands today, calls for experiments in the following:

1. Patch-cutting in the spruce-fir, mixed conifer type.
2. Thinning overstocked thickets of young ponderosa.
3. Conversion of non-commercial ponderosa to grass.
4. Removal of juniper and piñon where practical.
5. Chemical control of brush.
6. Thinning of stream channel vegetation in non-recreational sites.

It is important to remember the "proviso." The Water Resources Committee isn't recommending anything beyond the present research program until the experts, who should know, say it will work.

With this common-sense approach, the committee quickly established good working relationships with the Forest Service and Bureau of Indian Affairs, the two agencies managing some 90 per cent of the Salt and Verde watersheds.

The Forest Service agreed to take the lead in conducting experiments to prove whether patch-cutting could improve runoff in the spruce-fir and mixed conifer-type forests. About 100 acres of the Apache National Forest have been cut in this manner. Results are being closely watched. On an adjacent area, three small watersheds are being measured for rainfall and runoff before one is cut by patch method, one by the selective

method, the third left uncut as a check.

The Forest Service is also taking the lead in experimental work in ponderosa pine type, which embraces most of Arizona's not inconsiderable timber resources. Thinning of overstocked stands of saplings is taking place on several thousand acres of the Coconino National Forest. In the same general area, the Forest Service has removed all the noncommercial ponderosa pine from a 200-acre experimental watershed.

The Bureau of Indian Affairs and the Forest Service are both engaged in fairly large-scale juniper-piñon removal projects.

With the enthusiastic support of the Indians themselves, who are supplying a portion of the necessary funds, the BIA is removing 33,000 acres of juniper on the Ft. Apache Indian Reservation in a project being carefully measured for effects on water yield. Elsewhere on the same reservation, some 100,000 acres have been cleared of juniper and piñon, primarily to increase forage.

Forest Service juniper removal is approaching the 10,000 acre mark on the Wet Beaver Pilot Watershed Project on the Coconino Forest.

The same agency is in charge of experiments to convert brush to grass on selected areas of the Tonto and Prescott National Forests. Various control methods are being tried, the chemical tests on this particular project being handled by the Agricultural Research Service.

The fourth agency playing a major role in the Arizona Watershed Program is the U. S. Geological Survey. Survey technicians have installed and are readying stream gauging stations for both Forest Service and Indian Service projects. In addition, the USGS is undertaking an important project in cooperation with

the Land Department and Salt River Valley Water Users to measure the effects of removing cottonwoods growing along the banks of a stream located in Mohave County.

Research in watershed management and in the control and conversion of vegetation takes money, and the Water Resources Committee feels it has an important responsibility to see that agencies cooperating in the program get the necessary financial support. To this end, it has strongly backed agency requests for funds, and with good results.

Congress appropriated \$210,000 for watershed research projects in fiscal 1957, raised this to \$324,000 the following year, and made \$485,000 available this year. Some additional funds are appropriated by the state and by semi-governmental agencies such as the Salt River Valley Water Users Association. In addition, Indian tribes and ranchers are spending considerable sums each year in juniper removal work beyond the scope of these research projects.

Assuming positive results—and there will be a lot of long faces in Arizona if there are none—treatment of several million acres, at a cost of millions of dollars, will be the next step. How to raise the money, and the proportions to be borne by the several beneficiaries, are problems yet to be encountered.

The rapidly expanding Southwest desperately needs more water, and no one is more aware of it than the members of the Water Resources Committee. The committee feels it has taken a moderate, scientific approach to a problem that could easily become explosive in less cautious hands. It hopes the ultra-conservationist group on the one hand, and the "more water at any price" group on the other, will both be patient until the results are in.

Indian Water Needs

(From page 28)

that the controversy has been practically settled, more than 400 people have made application to build summer homes on the land surrounding this beautiful lake.

The White Mountain Apaches need the cooperation and assistance of all fishermen and conservationists of the state, as well as the general public, so that the officials in Washington will be convinced that watershed management programs are essential to good fishing and are good business.

Our tribe has initiated other watershed programs, such as our eradication and prescribed burning programs, which are well known to many conservationists.

This year alone, the tribe and the Bureau of Indian Affairs will spend in excess of \$135,000 eradicating juniper and other objectionable phreatophytes. It is contended by some authorities that by replacing these phreatophytes with grass and other beneficial vegetation, not only will the tribe benefit by being able to graze more cattle on the area eradicated, but down-stream farmers will receive more runoff. Perhaps I am getting a little afield of my main topic. However, I feel it necessary to premise my remarks with facts which should convince the ordinary layman that the White Mountain Apaches are developing their

recreation enterprises to the benefit of all. We must convince the farmers that if we are permitted to develop our entire watershed program, they, as well as ourselves, will benefit therefrom.

It is frequently stated that differences with Indian tribes could be easily settled if it were not for the over-zealousness of the Bureau of Indian Affairs in asserting Indian rights; however, in a recent Circuit Court of Appeals case, in speaking of an agreement entered into by a bureau engineer, the Court stated: "Viewing this contract as an improvident disposal of three-fourths of that which justly belonged to the Indians, it cannot be

said to be out of character with the sort of thing which Congress and the Department of the Interior has been doing throughout the said history of the government's dealings with the Indians and the Indian tribes. That history largely supports the statement: 'From the very beginning of this nation, the chief issue around which federal Indian policy has revolved has been, not how to assimilate the Indian nations whose lands we usurped, but how best to transfer Indian land and resources to non-Indians.'

We expect parties to any litigation to assert every right and defense which they have, be their names *Bristor vs. Cheat-ham*, *Arizona vs. California*, or *Water Users vs. White Mountain Apaches*. There is constant pressure by the would-be usurpers of Indian rights to have an act of Congress passed which would give the state courts jurisdiction in all water controversies. This, in effect, would deny the Indians their just rights due them

under law. It would vitiate the holding in the famous *Winters Decision* in which the Supreme Court stated that it would be extreme to believe that Congress, "... took from them (the Indians) the means of continuing their old habits, yet did not leave them the power to change to new ones!"

This same attitude has been taken by an agency of the state of Arizona, namely, the *Arizona Interstate Stream Commission*, which vehemently opposed the leasing of land to an outsider by the *Colorado River Tribe*, even though this land was located near the boundaries of the state of Arizona, and if it were developed, would not only benefit the tribe, but also the entire state of Arizona. And even though Arizona was fighting an uphill battle ever to gain the right to use one drop of additional water from the *Colorado River*, the *Interstate Stream Commission* instructed Arizona's chief counsel in the *Arizona-California* suit to

oppose the leasing of said land by the *Colorado River tribe*. Northcut Ely, California's attorney, when he learned of Arizona's attitude, informed Arizona's chief counsel that this was the first time he and the Arizona counsel had seen eye to eye in the law suit. I not only believe that the *Colorado River tribe* was sold down the river by this attitude, but I believe that history will prove that Arizona lost her chance at this particular time to use any additional water from the *Colorado River*.

In conclusion, I feel that our two greatest water needs today will be satisfied if the general public is convinced, and our Congressional delegation is apprised of the fact, that development of the water resources of the tribes will result not only in the Indians being assimilated, but also in the prosperity of Arizona; and if our people are assured that they shall always have their day in court—that is, federal court.

Urban Water Needs

(From page 30)

So it becomes apparent that until such time as we can develop some positive and dependable means of controlling and increasing the original source of supply, we must concern ourselves with the problem of allocation of what we have. Who gets how much?

It has long been obvious that everybody can't have all he wants—there simply isn't enough to go around. Justice and fairness would best be served if the division were based on *need* rather than *greed*. Clear, long-range thinking, with the basic premise, "The greatest good for the greatest number over the long pull," as the solid foundation upon which plans will be based, is an absolute must.

So we meet in conferences, committees, and conventions and many men—and women—give many, many hours of thought and study to the problem. The method may be slow and cumbersome, but it is just and fair—it's our American way!

In considering the needs—minimum, maximum, and average—of the various interests involved, some users have had sufficient past experience to be extremely accurate. A farmer knows how many acre-feet he needs to produce a crop of cotton, corn, or cantaloupes; the miners know to the gallon how much they will require to process a ton of ore, and so do many of our industrial plants. But I have yet to find a housewife who has the slightest idea how much water her dishwasher uses, or how many gallons it takes to fill her bathtub. Incidentally, her husband doesn't know any more about it than she does! Being in the latter category and an urban user, I'm

supposed to come here today and tell you what my needs (plus a few hundred thousand more just like me) are now, and what our future needs will be!

Frankly, I don't have even a vague idea—but I found somebody who doesn't even have to guess. He knows right down to the tenth of a gallon how much water I will use, lose, and waste on any one day, or every day of the year. He told me that our house used exactly 343.8 gallons last July 10th, and that that was 18½ gallons less than we had used on the same day five years ago, July 10, 1953! You know, it rather startles you sometimes to find out how much some people know about your most private and personal affairs! However, this "private eye" turned out all right; he is the head man in the water department of the city of Phoenix.

Statistics are difficult for me to handle, particularly so when we get above the figure ten. As for remembering . . . I have trouble with my own telephone number, and it has only five figures. I'm hoping most of you are the same way, and so will forgive me for not trying to impress you with a flock of figures which, once I had read them (and read them I would have to) we would both forget.

I am reasonably certain that all of you here are aware of the tremendous growth and development going on all over the West, and particularly this section of the Southwest. Many of you have been through this area on numerous occasions, at various intervals of time, in recent years. You are amazed at the changes you see on each new visit to our country. Some few of you may be here for the

first time, but I am sure that the very "newness" of much that you have seen, in and around our cities and towns, has told you the story of rapid and recent growth.

I will frankly admit to you that I did not attempt to research the urban and industrial water needs of all the cities and towns of the Southwest, as the general topic of this meeting indicates, perhaps, should have been done.

Nor is it my intention to attempt to forecast what our future needs will be. I'd probably start hiding water—burying it in milk bottles and gallon jugs in the back yard so that I would have some to drink in five or ten years—if I did that!

Let us, for a moment, consider the urban and industrial use of just one city, Phoenix, Arizona, in comparison with its needs 8 and 18 years ago—1958 against 1950 and also 1940. With practically the same standard of living conveniences as any other area you might choose, I think you will find the use of water very similar, and so these figures could well be applied in any given community—or extended by addition to include the entire arid Southwest.

In this fiscal year of 1958, our per capita water use has averaged 206 gallons per day; 242,199 people used 48.6 million gallons daily for the city. In 1950, 176,724 people used 37.3 million gallons, an average of 211 gallons per person per day. Ten years before that, in 1940, each of the 72,567 people in Phoenix used 231 gallons of water per day—for a total of 16.8 millions of gallons daily.



Champion field crew prepares to survey another tract of company timberland as part of its ownership responsibility.



Boundary corners are marked with monuments set into the ground. Metal identification tags are attached to trees along property lines.



When field work has been completed, surveys are carefully plotted, recorded and permanently filed.

PAPER BY CHAMPION

requires productive stewardship of timber resources

Papermaking requires many steps before a tree is cut for pulpwood. One of the first is acquiring land, either with usable pulpwood on it or as a future tree farm. Each tract must be carefully surveyed and permanent boundary monuments set in place. Such accurate surveying and recording is an essential part of Champion's forest management program, helping to make possible the most effective stewardship of its vital timber resources.



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It is interesting to note that with all our new appliances, such as automatic washing machines, dishwashers, and disposals, and in spite of the fact that you feel rather underprivileged now if your house has only two baths . . . with all of these things, we are actually using 25 gallons of water less per person per day, average for the year, than we were in 1940. Yes, I asked the same question—how does this happen? A number of factors are involved: refrigeration cooling rather than the evaporative type, and the development of much more efficient evaporatives; automatic appliances which get the job done without wasting water; the installation of water meters, along with higher rates which have served to make people careful about useless wasting of water . . . all this, together with a general consciousness in a high percentage of the population that water is a precious commodity in our part of the country, has been responsible for the reduction in our usage.

So, while the total gallonage used daily goes up and up inevitably as our population increases, the per capita use has declined, and the real experts on this subject—the men in the Phoenix Water Department—maintain that it will go down a little further. They expect it to level off at about 200 gallons per day. Present plans for expansion of the Phoenix system to serve 885,000 people by 1975 are based on 200 gallons per day average, with a peak load of 400 gallons per day.

If this figure of 200 gallons per day

can be assumed to be a fair average for urban usage, including, as it does in the case of Phoenix, the various industrial users out of the same system, then you can project the general needs for any community in a similar climate. Not too difficult a problem . . . the tough part comes next in most cases: where do we get the water? In an irrigated agricultural area such as Phoenix and the Salt River Valley the answer is simple: take it away from the farmers! Back in the beginning of this talk I mentioned something about a "fair and just" allocation, and I'll admit that last statement didn't sound much like either one; but let's see how it's done.

As the city expands, the farmers in the immediate residential areas find, suddenly, that their land is worth a great deal more for home sites than it is for farming, so they sell. In 1950 the city of Phoenix had an area of 21,376 acres, and the urban, industrial use of water figured to 2.2 acre-feet for each acre. That same year, 1950, the Salt River Water Users Association delivered 5.9 acre-feet to each of 232,000 acres being farmed. With the rapid expansion of population since 1950 and extending the trend, *conservatively*, to 1975, it is estimated that 130,000 acres of that 232,000 of the original project will no longer be farmed. Using only 2.2 acre-feet instead of 5.9 on that same land ($130,000 \times 3.7$) we will release 481,000 acre-feet per year, to be added to the water allocated to the 102,000 acres still being farmed (about 4.75 acre-feet per acre) or to be

used on new farms not now under irrigation. Thus, as we change from an agricultural area to an industrial-urban economy, our remaining farmers find themselves in a far more secure position as far as their water needs are concerned. None have been dispossessed or forced to sell—it's simply a case of land value and price.

Phoenix is in a fortunate position as far as her urban and industrial needs are concerned, but agriculture is mighty important too, if all of us urbanites are going to eat. It is obvious, with our present water supply, that we cannot add an acre of farm as we take away a farm acre for homes and industry. So it becomes equally obvious that the burden of supplying our agricultural needs must be shifted elsewhere, or additional sources of water be found.

Which brings up right back to the beginning—our basic source of supply, the rain and snow that fall on our watersheds. We know that wherever we go around this earth, the rivers, great and small, are born in the high mountains, the great forests.

And we also know, or should know, that wherever you go around this earth and find that man has continued to attack and destroy the forests, the soil has washed away, the streams and springs have dried up, the rivers disappeared.

In our *need and greed* for water, let us be extremely cautious with that vitally important basic source of our supply, our forests. They have been a mighty dependable water factory for longer than man has been walking on his hind legs!

Citizen Responsibilities

(From page 27)

in areas of moderate to heavy rainfall gradually flush or leach these salts through most soils into the underlying ground water storage basins or outflow rivers. Imperial Valley, with no penetrating rainfall, has had to use a different technique to dispose of the high salt content resulting from the use of Colorado River water which has averaged in recent years, at the intake of the All American Canal, about 700 p.p.m. of total dissolved solids.

Some 20 years after Imperial Valley started using Colorado River water, over 100,000 acres had gone out of production because of the ever-increasing accumulation of salts. To restore effectively the productive ability of this land, it was necessary to install carefully engineered and expensive tile drainage systems. Then, by periodically flooding the land with large quantities of water, the excess salts were washed or leached down three to six feet through the plant root area of the soil into the drain tile and out into

the drainage ditches and ultimately into the Salton Sea, where the salts continue to concentrate. Imperial Valley, with 1,800 miles of water distribution ditches, has had to build 1,400 miles of deeper drainage ditches to meet this "salt balance" problem. For example, Imperial Valley's Irrigation District's laboratory records show that during the year 1956 a total of 4,119,389 tons of salt were brought into the Imperial Valley through the All American Canal, and this same amount of tonnage, plus 18,745 tons more, was leached out of the farm lands by heavy irrigation that year.

Imperial Valley would long ago have been out of the agricultural business if it had to re-use the water from its downstream closed basin, as do all southern California coastal plain watersheds, because Salton Sea tests 33,000 p.p.m. of total salts. This is only 2,000 p.p.m. less than ocean water.

Every citizen needs to know more about the small watershed conservation

program that is the outgrowth of the need for tying together Soil Conservation District farm plans in small watersheds, thereby enabling the maximum soil and water conservation accomplishments to be achieved.

The objective of the 2,900 Soil Conservation Districts covering 90 per cent of the nation is to encourage all district land owners, both public and private, to learn the various individual soil characteristics of their land and then treat it for its conservation needs through the helpful guidance of a Soil Conservation District farm plan. These farm plans provide for increased irrigation efficiency through application methods that are tailored to fit the water-absorbing capabilities of each individual acre, thereby insuring the maximum coverage and maximum agricultural production with the use of the minimum amount of water.

The Soil Conservation District farm plan treated lands are the greatest upstream reservoir of all, because they will

act as a giant sponge to hold a large percentage of their total volume in water, which definitely helps prolong the downstream seasonal flow. *Positive proof* of this statement has been demonstrated many times this year in the completed conservation-treated small watersheds in Oklahoma and Texas.

The unsung hero in this work is the Soil Conservation District farmer who is *personally* paying for a major portion of the cost of this program on the nation's agricultural lands that insures watershed protection benefits for 87 per cent of the population living in cities and suburban areas. Virtually all other watershed protection programs come from taxes.

One of our greatest needs today is to further public understanding for the conservation land treatment program in some of the forest areas of our upper watersheds. This is the Fire Prevention Pre-planning Program. It calls for sufficient access roads with connecting trails and firebreaks, helicopter ports with small self-filling water replenishment underground reservoirs, cleared safety zones for crews and equipment to work from, as well as plainly-marked ridges indicating grade and other limitations for the safety of "cat" operations during a major fire outbreak.

In spite of new improved fire fighting equipment such as bulldozers, motorized tank trucks, and airplane water bombers, we are still having disastrous fires in southern California immediately adjacent to highly-improved and heavily-populated downstream areas, such as this month's Monrovia fire that burned 14,700 acres of invaluable watershed and cost half a million dollars to bring under control.

The real tragedy of these upper watershed fires, which can never be fully appraised, is the permanent damage to the water detention sponge-like mat of ground cover and very limited thin layer of top soil that enables normal rainfall to enter the ground on the steep slopes and emerge downstream crystal clear. In spite of a heavy seeding program on the 3,300-acre Arrowhead fire site and a mild winter of below-average rainfall with storms of low intensity, 750,000 cubic yards of irreplaceable top soil and debris washed downstream to create havoc and very costly debris removal on the valley floor the following winter. Another recent example of watershed destruction in our Soil Conservation District was the Monkey fire of last July 8. From one small 90 acre sub-watershed in this burn over 10,000 cubic yards of top soil and debris were loosened and washed downstream by a shower on July 28. This is only the beginning. Thousands of additional cubic yards of debris

will be washed down on the valley floor annually for several years from these major burns. Congress must be alerted and encouraged to follow the example of good land stewardship set by Soil Conservation District cooperators and provide sufficient funds to carry out the so-necessary watershed conservation protective land treatment measures on federal lands. Actually, Congress is legally and morally responsible for such measures. Greater efforts and funds must be devoted to research, to be sure that the best watershed management procedures now being developed at the San Dimas Experimental Forest or elsewhere are more widely understood, so as to provide

the maximum watershed protection and the greatest amount of water production.

The greatest concentration of effort should be made in developing our school curricula in the area of conservation studies so that every child will be impressed with the need for conserving our natural resources in order to provide a fuller life in the years ahead.

We citizens must work unceasingly to further a greater understanding of these conservation programs, and we must seek public and congressional understanding and support for proper watershed management to insure this country's future security as well as a prosperous life for future generations.

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Federal Responsibilities

(From page 26)

evident. Because of the inter-state and inter-regional character of such a program and its applicability to federal, as well as non-federal lands, it is evident that the federal government should play an important role in this field. However, a material contribution is being made and should continue to be made to this program by the individual states with respect to the specific physical and economic conditions within their jurisdiction.

In the field of watershed management research, the federal government has significant responsibilities. One of these is to assist the states in difficult problems with respect to inter-state and inter-regional river basins and watersheds. Research results and principles must be tested on a large scale to determine quantitative effects under differing conditions, impacts on other resources, and costs and benefits of such treatments. The pilot watershed management research study by the federal government on the Beaver Creek Watershed in the Salt River drainage basin is an example. Generally, such work is beyond the facilities and scope of an individual state.

Beyond the collection of basic data and research, which may be useful in any and all watershed development, the first step, and one that guides and determines subsequent activity, is planning and project development.

The scope of different federal agencies' activities in planning and project development varies, as does the proportional share of federal responsibilities in relation to non-federal. Within the small watershed development program, emphasis is placed on a federal-state-local cooperation approach, with greatest responsibilities in planning and development resting with local interests.

In the broader river basin phases of resource and watershed development, the federal government cooperates within the states through inter-agency river basin committees which include both federal and state representatives. In addition, federal reports with respect to basin development are referred to the states involved for review. Technical and field committees of different federal and state agencies provide coordination and guidance in watershed management methods and techniques. Federal responsibilities in planning and program development will continue to be coordinated and integrated with state and local interests in the interest of sound over-all resource development.

Congress has defined certain federal responsibilities with respect to aiding

non-federal action in developing, utilizing and conserving our land and water resources. These include loans, direct financial assistance, technical assistance, and provision for federal-state cooperative programs.

Financial and technical assistance towards sound land treatment and watershed management activities by non-federal action under the Soil Conservation and Domestic Allotment Act, various flood control acts, and the Watershed Protection and Flood Prevention Act (PL-566) are examples of the extent to which these responsibilities are being met.

Further, responsibilities in watershed management are being met by cooperative agreements with state governments for the provision of technical services in forest management and protection, financial aid to the states for fish and wildlife restoration and management, cooperative agricultural extension work, and numerous other cooperative agreements with state and private interests.

Other federal agencies are engaged in cooperative programs that actually involve direct participation with people. By cooperative arrangements and cost-sharing agreements, individual landowners are playing an important part in a large number of watershed management programs.

Present federal responsibilities are an outgrowth of and response to changing needs for utilization, development and conservation of land and mineral resources and related uses of water. In order to understand the increased measure of federal responsibilities it is well to look at its evolution.

In this country, rapid westward expansion and settlement provided lands and resources in such abundance that little heed was paid to proper watershed management. Initial federal concern, in response to public desire, was focused on means of extending settlement rather than the methods of settlement. Thus, early activity in maintaining navigability of rivers and streams as a principal means and chart for expansion was not related to watershed management.

As settlement progressed, the problems brought about by changing and increasing needs of resource utilization forcefully drew attention to the existing and future use of all resources, and reshaped many aspects of their development and conservation.

Interest in forest and land management by such states as Massachusetts, Michigan, Wisconsin, and New York in the mid-1800's led to the establishment

of state commissions to investigate the relationship between waterflows and watersheds. In 1886 the American Forestry Congress, sponsored by The American Forestry Association, adopted a resolution directing attention to the value of public lands at stream sources in the preservation of water supplies. It urged retention of large blocks of these lands in perpetuity for the public use, with a view to maintaining and preserving a full supply of waters in the rivers and streams.

During the late 1800's certain federal agencies, among them the Department of the Interior, urged the Congress to establish proper watershed management procedures on federal lands. Finally, in 1891, a rider that authorized the President to establish forest reservations from the public domain was attached to an act amending the public land laws. While the act did not give express recognition to withdrawing public lands in order to restrain floods and protect water supplies, such purposes were brought to the fore in hearings incident to the enactment of the law.

The Act of June 4, 1897, laid the basis for filling in the details of administration for forest reservations created under the 1891 law and specifically prohibited establishment of forest reservations except to "improve and protect the forest within the reservation or for the purpose of securing favorable conditions of water flows. . . ." Watershed management on federal lands is generally considered to be an outgrowth of this act.

Subsequent federal land-use legislation defined federal responsibilities with respect to public land, particularly forest lands. The interdependence of land and water was recognized by the Congress in a number of legislative actions.

The Weeks Law of 1911 provided for the purchase of land for the protection of watersheds of navigable streams by managing them as a part of and in the same manner as national forests. Thus, the federal government was authorized to extend its ownership on important watersheds outside the public domain.

The Clarke-McNary and McSweeney-McNary Acts in the late 1920's authorized watershed protection activities on non-federal forest land as well as watershed investigations and research.

The creation of the Soil Erosion Service by administrative action within the Department of the Interior in 1933 to combat soil erosion was an important step leading to a national conservation program. Subsequent action by the Congress led to its establishment as the Soil

Conservation Service within the Department of Agriculture with expanded functions. A later division of these functions by the Presidential Reorganization Plan No. IV in 1940 returned to the Department of the Interior those phases of the program dealing with soil and moisture activity on lands under its jurisdiction.

The Taylor Grazing Act of 1934 provided the basis for extending land treatment practices to more than 150 million acres of federal grazing lands in western United States. This legislation also provided the government with authority to classify lands for their highest use.

The Soil Conservation and Domestic Allotment Acts of 1935 and 1936 extensively broadened federal interest in land-use practices. . . .

The Flood Control Acts of 1936 and 1944 recognized watershed treatment as the counterpart and complement of downstream flood control, thus tying watershed management to flood control. . . .

Other legislation provided for specific responsibilities by land management agencies, again pointing out the interrelationships of land and water management. Financing private land-use activities, providing for research and educational activities, and providing for works of improvement for erosion and runoff retardation on upstream watersheds were authorized.

While primary interest in the prewar era was directed at planning for the resources of a major river basin such as the Missouri or Columbia, broadened public understanding in the postwar era brought increased awareness that in the major river basin plans attention was devoted primarily to major projects such as mainstream navigation and the multi-

ple-purpose dams for power-flood control and irrigation. Major river basin plans set forth desirable goals for resource use, but they could not make provisions for "grass roots" participation and support actually to accomplish the details of necessary watershed treatment on small integral portions of the watersheds. Recognition of this fact led to the small watershed approach to the use and development of soil and water resources.

In response to this trend, the Congress authorized the federal government, under the Watershed Protection and Flood Prevention Act of 1954, to assist local sponsoring agencies in the development of small watershed projects on non-federal as well as federal lands. Initiative was shifted from the federal government to local interests in the selection, planning, construction and maintenance of such projects. The cooperative approach in planning and carrying out land treatment practices within the framework of natural watershed units in the small watershed program resulted in a firmer foundation for the broader river basin programs.

Nothing can be done without public understanding and acceptance. There must be public understanding of the need, of the plan of action to meet this need, and of the expected results. The difficulty is that too often an understanding and acceptance come too late.

To meet the watershed management needs of the future is a tremendous undertaking which will require the combined and coordinated efforts of local and state government, private enterprise and capital, and the federal government. The federal government has not in the past, nor can it in the future, do the job alone.

Forests, Recreation, Wildlife, and Water

(From page 37)

relationships between water and the other forest resources, a much better job of producing the optimum amount of water with the least disturbance of the other resources could be accomplished. Research has determined some fundamentals regarding some of the relationships. From these findings, pilot test projects of considerable size and scope have been started in the ponderosa pine, the spruce-fir, aspen, and piñon-juniper types on the national forests. These tests are on national forests located here in Arizona. Through these pilot tests we plan to develop management practices for all resources which will provide the optimum conditions for the production of the water and still make it possible to have the other uses. Some uses undoubtedly will have to be curtailed, while others may actually benefit from the

practices which may be developed to improve the water flow.

At least the "pilot test" approach is a positive one, and the tests to date consist of the following:

In the ponderosa pine type, one test concerns complete conversion of the tree cover to grass or forage cover. We are also testing the effect on water yield of the application of best known silviculture practices in the second-growth pine stands. This includes thinning and pruning the pine and removal of all undesirable tree species in the stand. Block or patch clear cutting is being tested in the spruce-fir type. Again, complete conversion of the tree cover to a forage cover will be tested against methods of cutting or management which will increase regeneration of the better tree species. The piñon-juniper test will



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compare areas completely converted to grass and other forage plants with undisturbed woodland stands. The area of the drainages where the tests are being made ranges from about 200 to 2000 acres. In addition to determining the effects of these treatments on water yield, we also are watching closely their effects on forage, wildlife, and timber production.

This "pilot test" program is being done cooperatively with Forest Service Research and Agriculture Research Service people, the Arizona Water Resources Committee, the Arizona State Game Department, the Water Division of the U. S.

Geological Survey, and a number of other agencies and interested organizations. It was started in 1957, and so far the results have been largely learning the "whats" and "hows" for doing the job. One thing is certain, however: we don't plan to alter present satisfactory management practices until more information is available from the pilot test projects. In other words, we want to know what we are doing and how much it will cost before recommending a large-scale program to improve the water flows at the expense of the taxpayer.

In my attempt to show that a majority of the forest users are located in the

principal water-producing areas, I hope you haven't been given the impression that our chances for producing more water aren't good. This was not the intent. I intended to be realistic and point out some of the management problems which will be involved in a vegetative conversion program on the forests. I am confident that some additional water can be produced without too much disturbance of the other uses. As indicated, however, the accomplishment of this will require skillful management based on the best facts obtainable from research and the pilot test projects.

Coronado's Gold

(From page 17)

these men are farmers. The crops they produce are water, timber, and forage for livestock and wildlife. They encourage mining and they develop the recreational values of the forest.

The harvesting and use of the various forest resources on the basis of multiple use and sustained yield gives jobs to thousands and stimulates additional employment in the woods, on farms, and in cities. The mountainsides, through proper use, thus furnish additional income for many people in logging and milling; fattening and processing livestock; irrigation farming; mining and smelting; dude ranching; and in operating hotels, tourist courts, gasoline stations and other businesses serving tourists and recreational visitors.

Now let's talk a little bit about the various crops produced on the Coronado National Forest. There is *timber*—a surprising lot of timber in these mountains, almost 85,000,000 board feet.

Under proper conditions, a forest, ever-changing, will consist of seedlings from a few inches high to the height of a man; saplings competing with the tall, full-grown trees for light and space; and the matured trees, which, if not harvested, would eventually decay and finally crash to the forest floor, their economic value almost entirely lost to mankind.

Few persons passing through southern Arizona realize that the mountain country which flanks the highways is being managed for production of successive crops of trees. Away from the roadsides and recreational and wilderness areas, however, mature timber can often best serve mankind when harvested.

The harvesting of the timber crop in the Coronado is a continuous

process giving steady employment. Ripe trees are cut each year to supply the local demand for lumber, fuel, fence posts, mines, and other purposes. The cutting of timber is done according to a detailed management plan which provides for perpetual production. Young, fast-growing trees are left to form the basis of a new crop, to maintain the watershed cover, and to protect the land from erosion. The growing timber crop is protected from fire, insects, and disease. Last year, over 4,000,000 feet of timber was harvested from the Santa Catalina, Chiricahua, and Mt. Graham areas.

There is *forage*, the food for livestock.

Forage is grown as an annual crop on the Coronado Forest. Its utilization gives employment to local people and to others in the Middle West and on the West Coast.

The cattle business is one of the leading industries in the surrounding country. Over 235 stockmen living in Cochise, Graham, Santa Cruz, Pinal, and Pima counties graze approximately 35,000 head of cattle on the national forest range, which, for the most part, provides yearlong grazing. This is about one-third of all the cattle owned in these counties. The majority are breeding cows.

The necessary forage for the livestock must be provided each year without damaging the cover of vegetation on the vital watersheds. We have a number of real problems in this business of managing the range for the good of the stockmen and the land. Better distribution of livestock through the development of additional waters, such as springs, earthen stock tanks, and wells, will help alleviate over-grazed areas around existing watering places. Better management of our ranges

can be obtained by the construction of drift fences to provide for rotation of livestock from one part of the range to another. This will benefit not only the range but watershed conditions.

Another of our problems is the invasion of noxious or "weed" plants, such as mesquite and juniper, into our range lands. Such invasions reduce the amount of forage available for both livestock and cattle, and also use water that could be producing additional forage and also replenishing the underground water reservoirs. Men of Forest Service Research, the Agricultural Research Service, and the University of Arizona are making studies of the control of these "weed" plants by both mechanical and chemical methods followed by reseeding on the Santa Rita Experimental Range. This area, comprising 53,000 acres, is 35 miles south of Tucson and adjacent to the Coronado National Forest. The more successful methods of noxious plant control and reseeding are being applied on a practical basis on national forest ranges. Through research and proper administration, better range management will mean greater continued profits to the livestock operators, which in turn will affect the wealth of the community; and these benefits, together with the resulting conservation of our natural resources, act to the general advantage of the southwestern range country.

Another important crop produced on forest land is *wildlife*.

The proper management of wildlife by the Arizona Game and Fish Department and the Forest Service has increased the population of deer, turkey, trout, and furbearing animals on the forest. In cooperation with the Arizona Game and Fish Department, the hunting season has

been limited and wildlife has been protected from its enemies. Game habitat has been improved through the protection of the vegetative cover.

Although over 21,000 sportsmen come to the forest each year for fishing and hunting, fish and game species are coming back to their native habitat in many places. Trout are still scarce, but occasionally can be caught in places where there were none before, and in many areas deer can be seen from automobiles almost any morning or evening. The methods used to bring back and protect the wildlife, in cooperation with the Arizona Game and Fish Department, may be summarized as follows: (1) restoration of habitat; (2) protection from enemies; (3) control of hunting season; (4) control of wildlife; (5) protection of soil cover.

Near the international boundary with Old Mexico some rare and unique species such as jaguar, javelina, and coati-mundi are found. The Chiricahua squirrel, a large one, occurs only in the Chiricahua Mountains.

The various mountain ranges of the Coronado teem with bird life, including many rare species, and are paradises for bird lovers.

Another important crop, and becoming increasingly popular as America's population continues to grow is recreation.

Man needs beauty as well as bread. The high mountains, shaded with trees, watered by streams, and populated with wildlife, appeal to the thousands of people, local residents and tourists alike, who use the Coronado National Forest for recreation.

The forest is managed not only for the production of annual crops of grass, timber, and wildlife, but its outdoor playgrounds are also being developed in accordance with a definite program to provide camping, picnicking, riding, hiking, swimming, and winter sports for the public.

Almost 1500 miles of road and 900 miles of trails have been built on the Coronado. The million-dollar oiled Frank Hitchcock Forest Highway penetrates to the summit of the Santa Catalina Mountains and is used by over 380,000 visitors annually; another oiled road leads to Sabino Canyon, eighteen miles from Tucson, and is a very popular picnic area, particularly in winter.

Within the Coronado there are 49 developed picnic and camp areas. Recreational use of national forests,

including the Coronado, has grown by leaps and bounds. In 1945 there were 150,000 recreation visits to the Coronado, as compared to the present 1,000,000 recreation visits. As the number of recreation visits started to climb after World War II, recreation sites became more crowded and many deteriorated. Insufficient funds were appropriated to put the recreation areas in satisfactory condition. The situation became alarming, not only on the Coronado National Forest, but on all national forests. Our own Pima County, which includes major portions of the Santa Catalina and Santa Rita Mountains, realized the local situation and entered into a cooperative agreement with the Coronado whereby \$20,000 annually would be contributed by the county for the maintenance, cleanup, and expansion of existing recreation areas. Until this year, this was the only agreement in existence in Arizona whereby a county contributed funds to assist the Forest Service in the field of recreation. The Forest Service and the people of Tucson are indeed grateful. The many recreation areas on the Santa Catalina Mountains, such as this one in Rose Canyon, are a result of the cooperative agreement.

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you will be seeing another project which demonstrates the cooperative effort to provide additional recreational facilities, Rose Canyon Lake, completed in August of this year. This project was carried through to completion by cooperative effort of the Arizona Game and Fish Department, Pima County Parks and Recreation Department, and the Forest Service. In order to construct the dam that will impound 7½ acres of trout fishing water, the Arizona Game and Fish Department contributed \$50,000, the Pima County Parks and Recreation Department \$20,000, and the Forest Service \$11,150. The lake is presently about half filled, and will probably be stocked with trout in the spring of 1959. Inasmuch as there are no natural lakes on the Coronado, Rose Canyon Lake is certainly one of the finest recreational facilities to be added in recent years.

In addition to local interest in the recreation function of the Forest Service, Congress authorized "Operation Outdoors," the five-year recreation program that began July 1, 1957. Under this program we are trying to:

- 1) Bring adequate sanitation, care, and maintenance to all public-use areas.
- 2) Rehabilitate all existing areas to acceptable standards.
- 3) Construct facilities needed to accommodate not only the present but the future recreation use.

have combined to devise over many years, the farmers of the state face a hazard only if their principal water supply comes not from the canals but from pumps. There is no denying the fact that the underground water table in central Arizona has dropped sharply as more and more land was put into commercial agricultural production. Farmers receiving such water were faced with only one alternative; namely, to work less land, and this they have done.

However, there now appears another factor which will have a far-reaching effect on agriculture in Arizona. The fantastic growth of cities like Yuma, Tucson, and Phoenix has resulted in home-building pushing farther and farther out. Some 50,000 acres of farm land have been absorbed in home-building projects in these areas, according to estimates from quite reliable sources. Thus, there is less farm land than there ever was before. This is a serious matter, in view of the fact that Arizona farm products

To date, under this program, the Coronado has built two new recreation areas, rehabilitated and expanded two existing areas, and rehabilitated two other areas. This area, Rose Canyon, is being rehabilitated at the present time, with the rehabilitation of this particular site only recently completed.

One of our most important resource functions is the production of water.

The main water-producing areas of southeastern Arizona are the high mountainous regions, most of which are included in the Coronado National Forest. Most of these areas receive from 25 to 30 inches of precipitation annually. When the mountainsides are skillfully "farmed" so that they are producing trees, brush, and forage perpetually, the slow surface runoff of rain and melting snows contributes to the steady flow of springs and streams. The forest cover also acts much like a blotter or a sponge. The water percolates deeply into the subterranean ground channels and feeds the underground basins which supply the artesian wells, windmills, mines, and city water systems.

I'm sure you realize that if the mountainsides of the Coronado were to be skinned bare by fires, overgrazing, or destructive logging, the surface waters would rush down as if from a tin roof. Great losses of water in the channel sands, destructive

erosion, disastrous floods, and silt-laden water of inferior quality for domestic use would result. Percolation into subterranean reservoirs would also be greatly reduced, because mud and silt would soon choke up the ground water channels.

Practically all communities in southeastern Arizona, such as Tucson, Nogales, Willcox, Benson, Douglas, Safford, and Tombstone, depend for their water on underground water reservoirs. In order to further protect the watersheds vital to these communities, the Forest Service has withdrawn from grazing 26,000 acres in the Catalina Mountains, 14,000 acres in the Santa Rita Mountains, and 20,000 acres in the Pinalena Mountains or Mt. Graham.

Yes, you will find all of these resources present and in use on the Coronado National Forest—timber, forage, wildlife, recreation—and water. Here water is the treasure worth many, many times the gold that Coronado so vainly sought—it is a resource which ties all the other resources together and which we always keep in mind as we manage the other resources. Protection of the watersheds and water quality will continue to be our primary objective in the Southwest, and it will take increasingly intensive management and continuous research and development to meet the ever-increasing water needs of a growing population, industry, and agriculture.

Agricultural Water Needs

(From page 29)

mainly do not come under price supports but are non-surplus, and, due to our climate, are on most markets of the country before any competing products.

It would thus appear that the nation vitally needs the fruit and vegetable baskets, the red meats, and the American-Egyptian cotton grown on irrigated lands in our state. (Of the latter, 81,900 bales were produced in 1957, by four southwestern states.) Without these products the nation's diet would consist largely of corn, wheat, and such edibles as might come from cottonseed, and it is not a satisfactory picture.

The question follows: How will we get more water for irrigated lands? There is a group now working at it called the Arizona Committee on Conservation of Water Resources, and the effect of that committee's work will form a bright and shining picture in the history of reclamation in the Southwest. Its program includes, among many other activities, experimenting with growth in creek beds,

with clearances of underbrush, with removal of non-productive growth on watersheds such as cedars and piñons, and a careful adjustment of forest growth. This all points, of course, to conservation of such rainfall as we receive. This water, plus that from underground rivers, will replenish our sinking water tables, but only if we wisely pump out less than flows in. Therein lies the problem, and it is hoped that science and industry working together will reach a conclusive answer before too long.

The fact remains that Arizona and the Southwest, which were surely the bottom of a sea when the earth once was covered with water, must have wisely administered and prudently used sources of water for its agricultural community. The wealth that lies in the ground is not only metal which nature has so abundantly provided; it is the things that grow in such great profusion that it is not amiss to compare these fertile lands with the Valley of the Nile.

Water, Forests, and People

(From page 24)

Mountains. We will be traveling across the Coronado National Forest, which partly surrounds the city of Tucson and of which the Catalinas are a part. Theodore Roosevelt established this national forest from the public domain by Presidential proclamation, and during his term as President he placed 148 million acres of public domain in the national-forest system. The Forest Service was established while he was President. Here is the pen with which Theodore Roosevelt signed the act of February 1, 1905, marking the start of the Forest Service. It has an honored place in my office. I've wondered many times what words Roosevelt would write with this pen if he were alive today. Would he be proud of what we've done thus far? Would he be satisfied with our progress?

But our memory of Teddy Roosevelt must go far beyond the national forests and the Forest Service. As a small boy, I heard Theodore Roosevelt speak. I was, in almost the front row, and his dynamic personality made an impression on me that I can still feel half a century later. I've since read the words he said on that occasion. Here are two sentences from that speech:

"The conservation of our natural resources and their proper use constitute the fundamental problem which underlies almost every other problem of our national life. Unless we maintain an adequate material basis for our civilization, we cannot maintain the institutions in which we take so great and so just a pride; and to waste and destroy our natural resources means to undermine this material basis."

I could use those two sentences as a theme on which to base my remarks to you today. I intend to talk of two very important natural resources, forests and water, and to talk of these resources in terms of serving people. President Roosevelt was thinking of natural resources in terms of their usefulness to people. And you will note that Roosevelt was thinking ahead, thinking of what must be done today to meet resource needs of the future. I, too, had intended to say that dynamic vision is essential, and that just vision isn't enough; we must also be willing to act, to do whatever must be done to make our vision of the future come true.

This anniversary of Theodore Roosevelt's birth reminds me that today may perhaps be an appropriate time to suggest an idea I have been considering for quite some time. I wonder if, by Presidential proclamation, or in some other suitable way, one special day each year might be distinguished as Natural Resources Conservation Day? I realize that we already have many special days for one or another purpose. Maybe we already have too many. But none, not even Arbor Day, seems to fit the thought I have. I think we need some way to remind all people periodically of their absolute dependence on natural resources for the basic necessities of life. Perhaps it would do us all good to acknowledge publicly this dependence at least once a year.

A few days ago I happened across these words of Sir Julian Huxley: "People often maintain," he wrote, "that the discovery of how to release atomic energy has brought us to the brink of a new epoch . . . overshadowing every other modern hu-

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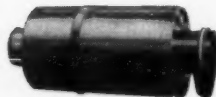
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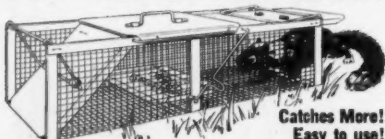
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man development. However, I . . . am quite certain that it is in the field of human biology, and in particular of human numbers, that man is facing his greatest challenge."

Huxley's contention is that if the earth is to nourish its growing billions of people in body and in spirit, man simply must establish and preserve a harmonious relationship with nature.

The history of mankind on this planet goes back about 50,000 years. Some 5,000 years ago the total population of the world is reckoned to have been about 20 million people. Not until along about 1850 did it reach the one billion mark. It took something like 4,900 years to get the first billion. It took only 100 years to add the second billion. Today there are 2½ billion people dependent on natural resources for food, clothing, shelter, fuel, and the raw materials that we use in making our lives richer and more pleasant.

In the United States there is a net increase of one person every 11 seconds. We have 50,000 more people than we had a week ago, 200,000 more than at this time a month ago. That's the equivalent of a fairly large city every month. In the first half of this century the population of this country doubled. Earlier this month it reached 175 million. By the end of this century—a scant 40 years away—we may have more than 300 million people for breakfast, dinner, and supper.

All these additional millions of people must be sustained on the same amount of land we have today.

I have heard the question seriously raised as to whether our natural resources are sufficient to sustain this exploding population. One thing is certain: We are going to have to manage our resources better than we are now. Wise management will require vision, careful planning, and resolute action. I do not think that wise management will just happen. We will have to make it happen. The first step is for people generally to realize that resources must have intelligent management.

I feel quite certain, for example, that most people have never given much thought to their continuing need for water. They've always had plenty of water, and it is only natural for them to assume that they always will have plenty.

Few people realize how dependent we are upon water. Water governs the entire system of nature in which man dwells. In the universe known to man, liquid water is a rarity. No

other world, to our knowledge, has the abundance of water that prevails on the planet Earth. No other world has a sea. Over 70 percent of the earth's surface is covered by water; and if the earth's crust were smoothed out, water would cover the entire surface to a depth of 8,000 feet.

The peculiarity about water on the planet Earth, and the thing that makes life possible on this planet, is that water exists primarily as a liquid. It exists as a liquid because of the temperatures prevailing here on earth. The temperature range which makes liquid water possible is a hairline band in relation to the immense temperature spectrum of the universe.

The abundance of water on earth, and the prevailing temperatures that permit water to exist as a liquid, are two fundamental facts of life.

Turning for a moment from the abundance and fundamental necessity of water to the paradox of water scarcity in the United States, we hear talk of the nation's water crisis. Is this far fetched? I think not. Basically there are two causes: (1) the growth in population to which I already have referred, and (2) our way of life.

What about water and our way of life? A shower bath takes 25 gallons; watering the lawn for an hour 300 gallons; to make a slice of bread 37 gallons; a suit of clothes 1,400 gallons; a ton of steel 65,000 gallons; a gallon of gasoline 10 gallons; an irrigated acre of corn 800,000 gallons, and so on. The average urban dweller personally uses 145 gallons daily. If the water required to make the things he eats, wears, and uses is also included, his daily consumption jumps to 1,200 gallons. Every day we find new uses for water, and we use it for purposes never dreamed of even a few years ago. We use water abundantly, I might almost say extravagantly, and often wastefully.

In 1955, the American people used 240 billion gallons of water per day. In another 20 years this consumption may rise—as a result of population growth and our changing way of life—to 350 billion gallons daily. This is equivalent to the daily flow of nearly 22 Colorado Rivers.

It is misleading, however, to speak of water in terms of national totals. Nationally, we have enough water, but it is not well-distributed in relation to our growing needs. Here in the arid Southwest—New Mexico, Utah, Arizona, western Texas, and southern California—water supplies

are in many places inadequate to support agriculture, grazing, and often domestic use. In places, underground water tables are dropping 25 feet a year, and irrigation wells are 600 feet deep.

Many of you, in coming to this meeting, passed through the Salt River Valley, a prime example of irrigation, which is man's greatest single use of fresh water. Irrigation accounts for about half of the nation's consumption of fresh water. Irrigation agriculture in the West has doubled in the last 20 years.

What is happening in the Salt River Valley? Something like 2 1/2 million acre-feet of water are being pumped annually from underground supplies. This is 1 1/2 million acre-feet more than the amount of safe yield. How can this overdraft be remedied? This is the prime question. It is like liquidation cutting of forests: it cannot be long sustained. Water, like timber, is a crop. We must not use more than we produce.

I do not mean to imply that informed citizens are unaware of what is happening. The state land department, the University of Arizona, the Salt River Valley Water Users' Association, and the Arizona Water Resources Committee are actively engaged in research, education, and programs of various sorts. Similar activities could be cited in other states.

The Charles Lathrop Pack Forestry Foundation has recently made substantial grants to Colorado State University for instruction and research programs in watershed management. Similar grants have been made to the University of New Mexico for public education regarding New Mexico's water and watersheds, and to the University of Arizona to establish a department of watershed management in the College of Agriculture.

Now what about the role of forests in our water supply? It is my firm conviction that forests are indispensable regulators of the kind and amount of fresh water available to mankind. They will continue so until the millennium is reached when we may depend entirely on desalted water from the sea, and when we need no longer look to the heavens for rain.

Many people do not know that one-third of this land of ours is forested; one acre out of every three. Even fewer realize that probably the greater part of our water originates on forested land. In the West, especially, most of the rain and snow

comes at the high elevations, and it is at those elevations on the high plateaus and mountains where we find the forests. Even in the East, the forested Adirondacks, Alleghenies, and Appalachians are the headwaters of most of the great eastern rivers. An example is the Potomac River, which flows by the national capital. The basin of the Potomac River contains the homes of three million citizens, and it is 50-percent forested.

Many years ago, Congress recognized the role of the forests in our water supply. By the act of June 4, 1897, it declared one of the purposes for which the national forests could be established was to secure "favorable conditions of water flows." Again, on March 1, 1911, Congress authorized the purchase by the federal government of forested, cutover, or denuded lands "necessary to the regulation of the flow of navigable streams."

Foresters and agriculturalists have contended for years that the best place to manage and control water is where it first falls. In large part that is on upstream forested land. It is general knowledge that the humus of the forest floor and the root systems of trees and other plants promote the storage of underground

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Forests perform two other functions of prime importance to water supplies. First, they foster soil stability, reduce erosion, and lessen sedimentation. Thus they enhance the *quality* of water. Second, they influence the amount of surface runoff and the *quantity* of streamflow. It is this latter function that sometimes generates controversy:

The prominent role of forests in supplying water for people to use is exemplified by the national forests, so many of which Theodore Roosevelt established. National forests cover one-fifth of the land area of the 11 western states, receive only one-third of the precipitation, but supply over half of the surface runoff. Similarly, these public forests make up only 19 percent of the Colorado River watershed, but they furnish 56 percent of the water. National forests are the major source of water for 1,800 towns and cities, and thousands more are partly dependent on water from the national forests. Over 600 western hydro-electrical developments depend on national-forest water.

In more and more instances, the amount and usability of water is of critical importance. In some places the question has been seriously raised as to whether the forest cover should be drastically altered with the intent of increasing water flows. I am hopeful that the actions eventually taken will be based on sound recommendations which, in turn, must be based on factual information actually applicable to each locality. Since this subject is of increasing interest, I want to comment on it briefly from the standpoint of national-forest administration.

Two factors are involved here. One is that nobody knows enough about the consequences to make

such a course of action immediately justifiable. More research is needed before scientists have the necessary knowledge as to what will happen in specific localities under certain conditions of cover manipulation. The other factor is the multiple services that the national forests perform in addition to serving as sources of water. Timber, recreation, livestock grazing, and wildlife habitat management must all be considered.

For example, here is the Southwest the lumber industry depends primarily on national forests for timber, and the current annual cut has increased 40 percent since 1950. Another example: Last year there were over 4¼ million recreation visits to the national forests of Arizona and New Mexico, an increase of 300 percent in seven years, and there were more than 700,000 hunter and fishermen visits. Another example of multiple use: about 70 percent of national-forest lands are grazed, and their continued use for that purpose is essential to the livestock industry of these two states.

Here we have the central problem of multiple-use resource management, which is how to adjust the often-conflicting use of all the resources of the national forests so as to be in the best long-term interest of the public, meaning everybody. Such questions bring some of the hard choices that public-land administrators must face—choices that are made doubly hard when the administrator doesn't have a sound technical basis for making choices.

We who are responsible for administering lands want to move just as rapidly as sound technical knowledge permits in helping to meet the acute pressure for water. We have adopted a policy, applicable to the national forests of Arizona, New Mexico, and California, of modifying management practices to improve water yields—when proved practical by research and trial application and when over-all public benefits will be enhanced.

I do not want to be misunderstood. Water shortages of the magnitude currently existing in the Southwest and of the potential magnitude I have described cannot be solved solely by manipulation of forest cover and at the sacrifice of other forest resources. Always, the primary role of forests in water supplies will be that of regulating flow, of contributing to soil stability, and enhancing water quality. Always we must consider the multiple resources that forests yield, of which water is but one.

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State Responsibilities

(From page 27)

respected in order to retain and promote sound and orderly development.

Next, the general responsibilities of the state consist of the following:

Gathering of information. There is an urgent need for an inventory of the water resources of the state. A study of the present and potential water requirements must be made to determine the water development potentials and plan for the best utilization of this vital resource.

The state must determine its water requirements and then provide ways and means of accomplishing the desired goal.

In order to obtain a sound water resource program for the state there is still considerable basic information required on which a future plan can be based.

An extension of the present snow survey program should be made to include all of the drainage basins within the state. Hydrological and climatological data are necessary to determine what precipitation can be expected over the drainage areas of the state. Precipitation is the basic source of water supply and the runoff is its visible result.

An accurate knowledge of the distribution of precipitation over the state and of its variation over time must be tied in with stream flow records for the planned utilization of the water resources.

Basic factual data is required for a sound water resource plan for the state and should include the following:

1. A state-wide mapping program.
2. Analysis of precipitation data.
3. Water supply requirements & utilization.
4. Surface and ground water supplies.
5. Land classification.

Research. There is a pressing need for more scientific knowledge concerning water development and its many ramifications. Research needs should be outlined, placed in priority categories, and coordinated with inventory and planning programs.

Research provides a sound basis for conservation activities.

More emphasis should be placed on applied research. Many dollars have been wasted on pet theoretical projects that have little or no application while practical problems cry for solution.

Realistic research is needed in the following fields which, in my opinion, are wholly the state's responsibility:

1. Reduction of waste in the use of present supplies.
2. Diverting waters from basins not utilizing their total supply into areas in need.
3. Underground water potential.

All agencies should cooperate in the following fields of research, but the state, in our opinion, should take the active leadership:

1. Artificial rain making.
2. Reducing transpiration by water-loving plants.
3. Deforestation of high mountain watersheds to increase total water yields and decrease interception.
4. Conversion of non-commercial pine to grassland to increase water yield.

Education. An important part of water development planning is a well-coordinated education program. This should motivate public support and understanding of the urgency of wise use and development of our water resources. It should also seek to gain acceptance of the multiple-use concept and illustrate the necessity of advance planning to coordinate all uses and put proposals in order of priority of need and use.

Stimulating action programs. The Public Law 566 authorizes a new federal-state-local approach to solve the watershed problems. Under the law specific responsibilities are placed on all three—federal, state, and local people—in initiating, carrying out and maintaining a watershed project.

The action of these services must be stimulated by state groups of specialists recommending programs to meet local conservation problems.

Coordination of effort. The execution of the watershed management plan will

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The states should encourage the formation of metropolitan water districts to develop and transmit necessary water to meet in the most economical way the requirements of a group of communities when those communities are dependent upon the same source of water supply or when existing water supplies prove inadequate.

Interstate compacts re: supply, use, demand, pollution. Every effort should be made to secure agreements or contracts between federal and state governments or with local interests to be benefited, under which surface and ground water benefits will be considered together, and all beneficiaries will be subject to the standard reimbursement obligations, whether securing the benefits from augmented surface or ground waters, before new federal reclamation projects or projects providing supplemental water or drainage for existing projects are undertaken.

Is there a need for a national water board of review? Such a board would be the most powerful in the United States, because it could control the future development of all the water resources and hydropower in the country.

"It would add to the federal structure, but not replace any agency. It would depend upon the respective agencies to supply them with reports and data. It would have no staff of its own to check the validity of the reports, the adequacy of the data or the interpretation placed thereon."

It seems what this country needs is a consolidation and better management rather than a review board. Such a powerful group would have the power to dictate what shall or shall not be developed and could stop every proposal and prevent its getting either to the President or the Congress.

Any state, in performing its functions relating to watershed management problems is, of course, directly concerned with the extent to which the problems influence its people and its economy.

The goals to be achieved through watershed management and the methods of management can vary significantly, depending upon whether the aim is to materially retard erosion and streamflow or to effect erosion control without materially changing the streamflow.

In the eastern and central portions of the country, where flood control must be effectively practiced on a broad scale, few serious problems have arisen between water users and watershed management agencies. In the semi-arid West, however, the available water supplies are a somewhat more critical factor

in the economy of the entire region. Getting as much water, rather than as little water, as possible is the principal interest of the public in this area. It is generally recognized that in achieving these aims there must be some effective erosion-control programs. Any watershed management program designed to materially lessen or retard stream flow is likely to encounter stiff criticism or opposition.

In those western states having high percentages of federal lands located in the upper reaches of the drainage basins, the problems associated with watershed management can be particularly serious. Water users in the low-lying drainage areas are anxious to have the benefit of as much water as can be made available. The agencies responsible for the management of watershed lands may have erosion control and the retarding of runoff as their goal. Such interests cannot help but conflict. It is within this area of conflict that the states must assume a leading role. The state agencies become focal points for the expression of the needs and interest of the water users.

The general system of water law in the western states, wherein priority may be an important part of a water right, can, at times, be in conflict with proposed watershed management programs. If such programs will materially alter the runoff characteristics of streams and interfere with established "high-water" rights, there is a likelihood that serious differences will occur. Here again the state agencies can become the focal point for seeking solutions to the problems that develop.

In recent years, certain groups of water users in the Sevier River Basin in Utah have criticized watershed management practices as being a contributing cause for what they felt were diminishing water supplies. They have questioned forest-management aims in general and contended that the building of numerous stockwatering and water-detention structures in the upper drainage areas has altered the stream runoff conditions. Because of those problems and others relating to water supply and conservation, a broad study program has been undertaken for this basin.

Watershed management on state lands. The subject of watershed management is one that has received the attention of land managers for many years. Unfortunately, more effort has been expended on the discussion than on action. The intimate relations of land and water and the effects of land treatment upon the nature and quality of streamflow have been recognized as far back as the days of ancient Greece.

Within the United States, federal, state and community-owned lands com-

prise more than one-fourth of the nation's 1.9 billion acres. Of these, lands in state ownership total approximately 80 million acres, of which one million acres are reserved for institutional sites. The remaining 79 million acres are generally used for more than one purpose—grazing, lumbering, recreation—and include lands of high water-yielding capacity.

Considering the many states involved and the variance and complexity of state governments, multiple-use management on state lands presents a variety of conditions, varying from good to very unsatisfactory from a watershed viewpoint. Fire protection on state lands is generally good; however, the maintenance of protective forest and grass cover varies considerably. In general, the maintenance of adequate vegetal cover for the protection of the watershed receives considerably more attention in the East than in the West, where some lands receive little or no protection or management, are in poor condition, and are damaged by accelerated runoff and erosion. There are some exceptions, but on the other hand, some states don't even know how much land they own nor the location of all ownership.

States, by proper organization of administering agencies, can achieve the basic principles of multiple use. This has been done in some states, others are in the formative stage, and still others are lagging far behind. To achieve this principle of multiple use on state lands, it is necessary to remember that coordination is the keynote, and that each resource—timber, forage, game—must be developed and used without undue interference with other resources. The job of integrating watershed management with other land-use activities is not easy, but it can be done.

Protection and proper management of all watersheds—state, federal and private—must be achieved if our nation is to grow and prosper. Protection does not necessarily mean closure of a particular watershed area to all uses. Through proper management most, if not all, of our watersheds can contribute to many beneficial uses.

Outstanding watershed needs on federal, state and private watershed land have been summarized in the past by The American Forestry Association. They include:

1. A nationwide inventory of areas that are sources of water, with special reference to the amounts, rates and qualities of water flow and the types, extent and values of water use.
2. Classification of watershed forests in terms of their requirements and values for the highest water production, erosion prevention, and

flood and sediment damage abatement.

3. Application of measures to protect and manage forests, designed to maximize the contribution for a given set of conditions, with regard to the requirements for timber, recreation, and other forest products and services.
4. Intensified and more widespread application of measures to improve soil and waterflow to forest and other parts of damaged watersheds.

Pollution control in watershed management. The state's interest in water should go further than merely determining the quantity of water available and the adjudication of water rights for agriculture, industry, municipalities, fisheries and other recognized uses. The quantity of water delivered to the point of beneficial use is not the sole criterion for determining how water-wealthy a state may be. Quantity without quality—and by quality I mean the absence of contaminating bacteria, chemicals, silt, organic matter and other solid materials—is of little value if the water cannot be used to foster the needs required by our present and future generations.

It is the responsibility of all states to consider, along with federal agencies and private enterprises, the utilization and development of their land and water resources. Such responsibility should include: (1) preservation of the excellent quality of water in presently under-developed watershed areas, and (2) restoring the quality of water in other areas to conditions permitting increased beneficial uses. In the utilization of water and the development of our watershed areas, the margin of profit of any enterprise—lumbering, grazing, mining, manufacturing—must withstand the cost of providing adequate watershed management practices. Should the cost of such uses and management be excessive, the development of the resource should be discouraged in the interest of the water supply. It is axiomatic that polluted water impedes economic and social progress.

It has been determined that the quantity of pollution is directly proportional to population and industrialization. Water pollution has been increasing, is serious, and may even be more serious in the future. Carl Schawb of the U. S. Public Health Service reported in 1955 that effluence from sewage and industrial waste outlets equivalent to waste from 150 million people was being discharged untreated into American streams.

A further survey by the Public Health Service of 11 major river valleys representative of the country as a whole proved conclusively that even though all streams are not polluted the major

streams of our nation are gravely affected and the problem is nationwide. This survey also indicated that pollution is a factor that already affects or eventually will affect all water resource development, whether it be for flood control, irrigation, hydroelectric power, municipal and industrial use, or recreation. The survey further pointed out that pollution is predominant in the highly industrialized East, but that no one section of the country is free from polluted streams.

In addition to dumping of sewage and industrial waste into streams, there are other widespread sources of stream pollution. For example, the improper construction of roads and highways can influence the amount of silt in a stream. Likewise, dredge or placer mining, improper logging practices, and overuse of watershed lands by domestic livestock and wild game may so expose the soil that it is readily carried into the stream channel with liberal quantities of human and animal waste.

Pollution control belongs to the states. At the present time there is no federal legislation which authorizes any federal agency to supersede state authority in the enforcement of antipollution measures. In the Pollution Control Act of June 30, 1948, Congress recognized, preserved and protected the rights of the state in controlling water pollution. The act further specifies that federal techni-

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cal and financial aid will be provided to state and interstate agencies and to municipalities in the formulation and execution of their stream pollution abatement program. . . .

Research programs in watershed management are expensive. They represent considerable investments in structures, lands, and time. Personnel costs are also a factor. Watershed researchers fall into several categories: foresters who have acquired advanced training in hydrology, soils, ecology, and physiology; ecologists, soil scientists, and geologists; and engineers with diverse educational backgrounds.

How to achieve an expansion in watershed research is not a simple problem, but several suggestions are in order:

- (1) Educational institutions need more contributed financial support to provide more and longer-term fellowship grants.
- (2) Federal agencies have supported most of the research in the past. Schools, experiment stations, conservation departments, and commissions must accept

greater responsibility for fostering research.

(3) Coordinated teamwork or cooperative group research within or among agencies should accelerate the amount and enhance the quality of research.

(4) Most schools have limited research budgets. Perhaps a concentration of effort in a few fields would be more fruitful than an overextension into many fields.

(5) State research advisory committees may be of value in directing attention to problems of high priority; guarding against duplicating research efforts; and encouraging more widespread distribution of findings.

(6) More research could be supported by an increase in cooperative research projects between schools and federal agencies.

I have attempted in this paper to bring to your attention some of the factors in watershed management and research which in my opinion are the state's responsibility.

Tucson Convention—Best Yet

(From page 15)

Fox told the members, "In essence, the Arizona Watershed Program is the multiple-use principle of federal land management carried to its ultimate, and by that we mean: watersheds so managed as to provide the optimum in terms of water, timber, grass, game and recreation."

What are they recommending? A major recommendation is that spruce-fir and mixed conifer forest types be harvested in strips or patches rather than by selective cutting methods, similar to Douglasfir management in the Northwest. Will Northwest methods work in the Southwest? They don't know yet, and they won't until research provides the answers.

Another major objective of this water program is to thin ponderosa pine, Arizona's best source of commercial timber, in order to clear out choked up understories, grow better timber faster, provide more forage and produce more water. Will that work in Arizona? They don't know yet, but more than 2,000 acres have been so thinned on the Wet Beaver Watershed project with plans to open up more yet.

Spruce, fir and ponderosa pine, of course, are valuable commercial trees. The spruce-fir-aspen forests, while not extensive in Arizona, are in high rainfall belts. Other types with which most easterners are not

so familiar include juniper, piñon and chaparral. After seeing these types on the ground their importance recedes in the minds of most easterners, for they are a far cry from the handsome stands of commercial trees grown in the East, the Southeast or the Northwest. The problem here, of course, is whether these somewhat scrubby-looking trees have their purpose in the ecologic pattern too. Is it safe to clear hundreds of thousands of acres of these trees to produce more pasture? Will this actually produce the type of water runoff southwesterners desire? Obviously, these are critical questions, and here again everyone we talked to stressed "we don't know the answers yet, but we're trying to find out."

No observer who has had it drilled into him that inquiring research is the fundamental base of scientific land management can find fault with an approach of this sort. In an attempt to further clarify the picture we sought out Fox, who told us records kept by the Salt River Project on runoff and rainfall revealed by the middle fifties "an alarming decline in run-off that did not correspond to a similar decline in rainfall." Choked understories and the rapid invasion by so-called weed trees were believed by many to be a major reason for this, he said.

"Barr is an agricultural economist, and let's admit he went further than proven research in his report," Kel told us. "He urged action on a large scale to meet problems to which research obviously did not know all the answers, and he tried to stimulate that action in an attempt to have all these possibilities fully explored. Certain of his statements obviously could be used to create alarm, and they were."

That this was an understatement is realized when one recalls the article written by Dr. Krutch for *American Forests* in April, 1957, quoting one speech by an Arizonian in which he said in part "... I have just written off the forests of the Southwest and a large part of those located elsewhere in the United States ... no longer will millions of trees keep a large percentage of rain and snowfall from reaching the ground."

Statements of this type will doubtless rise up to haunt Arizonians for years to come. The Barr Report itself is regarded critically—and rightfully so—by many groups, including sportsmen and the pulpwood industry. In the summary of this report it was stated, "The program ... includes drastic thinning of ponderosa pine stands. ... The pulp industry will not develop fast enough to provide wholesale cleanup of all forested areas. ..."

That there are people in Arizona who subscribe to some pretty drastic watershed measures is obvious, in view of comments of this nature, but it must be reported they were not in evidence at AFA's first Arizona meeting. The accent there, by all concerned, was on research—painstaking research, including cowmen, foresters, agriculturists and sportsmen.

Old Timers Luncheon

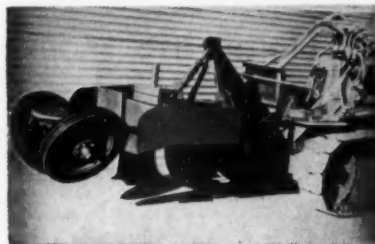
(From page 39)

master Kellogg as "a man who can get mixed up in more controversies than any man I know." What Mr. Kellogg meant is that Prof. Chapman, sometimes referred to as the "conscience of the forestry profession" has always made himself heard on all questions involving professional or legislative principle as they apply to professional forestry. Both the *Journal of Forestry* and *American Forests* continue to hear from him regularly, it might be added.

A. B. Rechnagel, Ithaca, New York, served both for the national forests and the woods industries and continues to be active in New York State forestry affairs.

On the basis of the facts disclosed, an observer must conclude that representatives of this water-conscious state decided that agitation was the prelude to research action. With that phase of the effort achieved, the lid apparently has been clamped back on, with stable, representative citizens determined to see to it that research will be the marker on every guidepost as the state attempts to work out its water salvation. The fact that such widely-known conservationists as Lewis Douglas and Senator Carl Hayden are riding shotgun on these efforts also affords a degree of stability. People who know Carl Hayden are quite certain no program will ever gain his approval unless the facts are known on the basis of proven research.

Finally, the men really in the saddle in this effort are the trained professionals in the various government and state services. One definitely obtained the impression in Arizona that these scientists are in charge. Finally, a question that looms important in the minds of visitors to the state is this: Assuming that research shows that thinning of commercial trees and removal of scrub trees actually works, will even this measure really solve the water needs of this growing state? Arizonians reply, "We've got to start someplace," but a visitor gets home pretty certain in his own mind that more water from watersheds won't be enough—that the answers to this big problem must, ultimately, be much bigger than that. There was more truth than poetry in Mr. Stamm's somewhat facetious comment that he "wished he could divert some of the water in the Columbia River to help fill Arizona's pressing needs." (J. B. C.)



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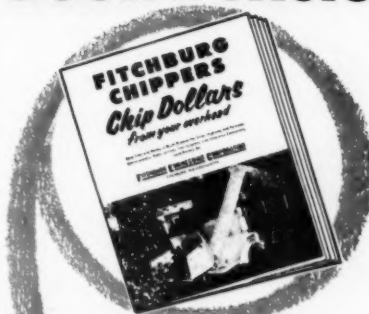
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Forest Forum

(From page 3)

giving any of the arguments or discussion in opposition to this point of view. You probably did not intend to give this impression, but nevertheless your article made us think that you thought one of the answers to Minnesota's forest problems was increased public ownership. More specifically, the comments in your article that we are disturbed about are as follows:

1. Where you mention 37 per cent of the total commercial forest lands as being on the tax roll, which incidentally should be 44 per cent, you say nothing about the fact that this small portion of forest land in private ownership is rather unique compared to most states. As you undoubtedly know, there are only three states in the entire nation that have more commercial forest land in public ownership than Minnesota, and only nine states that have a larger proportion of their commercial forest land in such ownership. All of these states are in the West. It seemed to me that in discussing this subject some mention of this fact should have been made.

2. You say that some of this tax-forfeited land has been redeemed, cutover, and abandoned a second and third time, with accompanying loss of revenue to the counties. I question that much land has been abandoned the second time, and believe that the amount abandoned the third time is insignificant.

In discussing this point, it seems to me that some mention should have been made of the fact that a major cause of the initial tax delinquencies and tax forfeiture was a tax rate considerably higher than the earn-

ing capacity of the land. For example, in the early thirties the Northwest Paper Company made application to place a large block of their lands under the Auxiliary Forest Law but was turned down by the county and, consequently, these lands were abandoned and forfeited. Mr. Allison has made a study of this situation and has shown that if these lands had been accepted for Auxiliary Forest the county would have earned a very substantial revenue over the years in contrast to very little revenue under the practice followed.

On this same point it is significant, I believe, to note that delinquent lands in northern Minnesota in the late twenties and early thirties were taxed at an average rate of about 28¢ per acre, and this tax is at least four times more than the present net revenue to the county from their tax-forfeited lands. I did not expect you to make the above comments in your article, but in discussing the subject of tax delinquency and abandonment it seems to me that you might have mentioned that this was due in large part to an unrealistic tax rate.

3. You mention 3 million acres as being in county ownership in Minnesota, and I believe the correct figure is closer to 4½ million acres. Incidentally, this is more than half of all the commercial forest land in county and municipal ownership in the entire United States. It seems that this point might have been noted in your article.

4. Your article quotes one county official as estimating net income for his county forest as 22¢ per acre as against 6½¢ per acre for private forests. As you know, this figure of 22¢ was seriously questioned at the Grand Rapids meeting, but still your article indicated no question whatever about its accuracy. These figures are wrong in both instances, in that county forests are not returning 22¢ per acre in any county that we know of and only a very small acreage, if any, of forest land in private ownership is paying as little as 6½¢ per acre. Private industrial forests are paying an average of at least 25¢ per acre in Minnesota, and I am sure that private forests in other ownerships are probably averaging close to 25¢ per acre. In 1957 our company's tax rate was 10¢ per acre for all lands under the Auxiliary Forest Law and nearly 22¢ per acre for all of our lands.

5. Your article also mentioned opponents blocking land exchange on the grounds that it is unconstitutional for the state to swap land with itself. The implication is that some group in Minnesota has been opposing land exchange between the county and state. I do not believe this is so, but think such exchanges have failed because of failure on the part of state and county officials to get together on required legislation.

6. In your comments that counties dislike to sell stumpage that is processed outside the county, it seems to me you could have made the point that although there are surpluses of some woods, particularly poplar, in some counties, you can not expect the establishment of high-cost mills wherever there may be surpluses of low quality wood. This is particularly true if the counties are not willing to sell lands or



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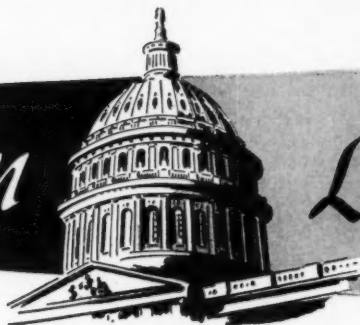
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(Turn to page 67)

Washington



Lookout

By ALBERT G. HALL

THE NOVEMBER ELECTIONS were not greatly influenced, if at all, by forestry or conservation issues. In fact, there appear to have been few major issues at stake in the majority of the campaigns for the Congress. The loss of Republican strength in the Senate and House was in large part the usual loss of any administration during off-year elections, and in part showed a trend away from the basic Old-Guard concepts of the Republican Party. The effect of the elections on conservation legislation may be great, however, even though conservation was not an issue in the Congressional campaigns. Studying the make-up of the 86th Congress, one cannot help but be impressed by the realization that the states' rights and individual responsibility concepts of American government have been weakened, and that the forces for increasing federal action have been strengthened. Observers credit the activity of labor unions for the election of a number of the Senators and Representatives. Where labor unions have had conservation policies in their programs, they have tended toward federal rather than state or private action.

THE MAJOR COMMITTEES OF CONGRESS have suffered very little change in the Democratic column. In the Senate, no changes were effected by the election on the Democratic side of any committee. In the House, the only Democratic losses in committees dealing with conservation issues were: Mrs. Knutson of Minnesota from the Committee on Agriculture, Representative Sieminski of New Jersey (not a candidate) from the Committee on Appropriations, Representatives Engle of California (ran for Senate) and Shuford of North Carolina (not a candidate) from the Committee on Interior and Insular Affairs, and Representatives Robeson of Virginia (not a candidate) and Dellay from the Committee on Merchant Marine and Fisheries. From the Republican columns, however, Senator Thye of Minnesota will be missing from the Committee on Agriculture and Forestry, and from the Appropriations Committee, along with Senators Knowland of California, Potter of Michigan, and Ives of New York. Senate Interior and Insular Affairs Committee will be operating without Senators Malone of Nevada, Watkins of Utah, and Barrett of Wyoming. Senate Public Works Committee will have lost Senators Martin of Pennsylvania (not running) and Revercomb of West Virginia.

REPUBLICAN LOSSES IN HOUSE COMMITTEES include Representatives Hill of Colorado, Simpson of Illinois, Harvey of Indiana, Williams of New York, Harrison of Nebraska, Krueger of North Dakota, and Tewes of Wisconsin from the Committee on Agriculture. From the House Committee on Appropriations, the Republicans have lost Representatives Scrivner of Kansas, Clevenger of Ohio, Wilson of Indiana, Miller of Maryland, Vursell of Illinois, and May of Connecticut. From Interior and Insular Affairs Committee: Miller of Nebraska and Dawson of Utah. From Public Works Committee: McGregor of Ohio, Scudder of California, George of Kansas, Stauffer of Pennsylvania, Byrne of Illinois.

REPUBLICAN COMMITTEE LOSSES will be greater than is indicated by the absence of those who were defeated or who did not run. The committee lists will be considerably more unbalanced in the 86th Congress than in the 85th. During the 85th Congress, Senate committees listed only a majority of one Democrat on each committee; in the House committees the Republican strength was roughly 80 percent of that of the Democrats. In the new Congress, it is expected that committees may be manned two to one in favor of the Democratic party.

LIBERAL OR SO-CALLED MODERN REPUBLICANISM was the victor in one side of the November vote, and except for the South the liberal Democrats have also gained more
(Turn to next page)

ground. While the major committee chairmen are for the most part the continuing Southern and somewhat conservative Democrats, the new members of the committees, both Democratic and Republican, will be chosen from among the more liberal members of both parties. Liberal Republicans were, in some instances, hidden away with minor committee assignments in the 85th Congress. Their strength in the 86th, however, is such that they will be much more prominent among the minority leadership. Conservative Southern Democrats will have to search longer and harder to find support among the Republicans for their stand on states' rights.

FROM THE BUDGETARY STANDPOINT, the predominantly Democratic Congress, although identified during the campaign as "the spenders," may be more inclined to look toward 1960 than to greatly expand budgets. Although the Republicans cannot capture control of the Senate and House in 1960, there is still the presidential election to consider. Consequently there may be considerably more caution displayed in public spending, especially if such spending might lead to greater deficit financing.

TWO NEW MEMBERS WILL BE NAMED TO THE RECREATION RESOURCES REVIEW COMMISSION as a result of the election. Republican Senators Barrett of Wyoming and Watkins of Utah, both of whom lost to Democratic nominees, will be replaced. While it is believed that other western Republicans will be named to the Commission, it is unlikely that two more solid conservatives, in natural resource matters, can be found in that region.

THE LOSS OF WESTERN REPUBLICAN SENATORS Barrett and Watkins, and especially Watkins, makes possible the release from the Senate Committee on Interior and Insular Affairs of the controversial wilderness preservation bill. If the bill ever leaves the Senate committee, it stands a good chance of passage on the Senate floor — too few other members of that body understand the bill or consider it important enough to fight for or against it.

FOREST PRODUCTS PRICE REPORTING, another controversial measure, chiefly because it is unnecessary for the federal government to engage in the direction of a program which is gradually making headway within the states without federal help, stands a good chance of being authorized and directed by Congress. The major proponents of the measure have returned to the Congress, and here, again, is a piece of legislation that will be considered of too little importance by the majority of Congress to fight to prevent its passage. Senator Proxmire of Wisconsin has already used the first of a series of hearings on small forest business, held by the Senate Small Business Committee, to generate support for the bill. He has also continued to urge the establishment of a federally-sponsored pilot plant in Wisconsin for the manufacture of newsprint from hardwoods. This was proposed in a bill by the Wisconsin Senator last year, but did not stand a ghost of a chance of passing, because the technology to be proved by the pilot plant had already been proved and placed in commercial operation. It may stand a chance of passing in the 86th Congress, however. Some of the labor organizations are for it, and it can also be expected that liberalism may be interpreted to mean liberalism with tax money.

PUBLIC WORKS PROGRAMS which the Eisenhower Administration has kept fairly well within reasonable bounds, after the veto of authorization measures that would have permitted many new and unsubstantiated starts, can be expected to be pushed vigorously by the new Congress. New members will be looking at both new and ancient proposals in order to spend some federal money in their constituencies. Forestry interest should watch these proposals very closely, since water developments usually involve the taking or the control of considerable acreages of valuable forest lands.

FEDERAL FORESTRY PROGRAMS over the past decade have followed a more or less sane and almost scientific approach, increasing in line with the increase in the over-all economy, just about as fast as technology and research could push them — possibly lagging a bit behind research, which is a normal and logical process. It is not expected that any great increase in this logical, orderly development will take place during the 86th Congress. If money is going to be spent, thereby increasing the federal deficit, and further devaluating the dollar, it will be essentially on things spectacular. We can expect therefore that forestry and conservation will proceed at a normal pace. But watch out for any spectacular program that will make news, even if not scientific sense!

Forest Forum

(From page 64)

give any special consideration to industry with respect to their raw material needs when so much of this raw material is under government ownership. Also, this surplus of hardwood is not unique for Minnesota and there is competition among states for industries to use this kind of wood.

7. At the end of your article you note that public land agencies are obviously held in high esteem in Minnesota. I have no quarrel with this, but you would hardly expect a contrary opinion at a meeting with county land managers and consisting largely of representatives of public agencies. After all, the Land Ownership Committee called this meeting for the purpose of obtaining the county's point of view, and there was no special effort made to obtain opinions from private owners.

I am afraid you will think the above comments are unduly critical, and perhaps they are because I am sure you did not promote the idea that we need more government ownership in Minnesota. However, I did want to discuss this with you because I am concerned over what seemed to me to be a one-sided story and because I know your magazine carries a great deal of influence with a large audience.

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EDITOR:

American Forests has always been a source of a great deal of pleasure and instruction. I find this most exemplified in the "Reading About Resources." The comments and criticisms by Monroe Bush about the latest additions to the growing literature of resource conservation I always find to be illuminating.

The September issue was especially delightful. The comments by Monroe Bush on the latest report of the Conservation Foundation, "Resource Training for Business, Industry and Government," were revealing in dealing with the aspect of integrating the various specialties as soil, water, and forest conservation into the general term "conservationist." . . .

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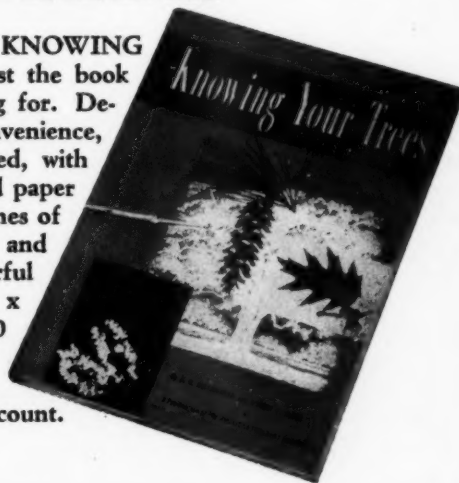
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Feature Photo of the Month

Photos used on this page will be of unusual rather than esthetic qualities and subject matter will be restricted to scenes, events, objects or persons related to the use, enjoyment or unique aspects of our renewable natural resources. For each picture selected AMERICAN FORESTS will pay \$10



John Brinkley, of the Forest Service, rode herd on the burro and played the role of the prospector in the Bergoffen pageant

One of the biggest hits at the 83rd Annual Meeting of The American Forestry Association was a burro. The burro was a star attraction in the pageant "Salute to the Forest," that was written by Bill Bergoffen of the Forest Service, in which various users of forestland paid their respects to a blowup of the Forest Conservation Commemorative Stamp, as unveiled by Smokey Bear. The well-mannered little animal—the prospector's best friend—played his role like a star trouser and was cheered to the echo by an audience of more than 500 at the Pioneer Hotel.



It's A Money-Maker!

NEW

HOMELITE 7-21 Chain Saw

Designed for the professional woodsman, the new Homelite 7-21 chain saw lets you cut more wood faster, with less effort and more profit. Its balanced 21 pounds* is easier and safer to handle in any cutting location, any cutting position . . . lets you cut longer without tiring. The big fuel tank allows for more cutting time between refuelings. The rugged gear drive delivers enough lugging power to fell trees up to 7 feet in diameter, cut 20" trees in 18 seconds.

And look at the 7 quality features that mean greater dependability, less down time, lower maintenance; features like: the famous Homelite high-compression short-stroke engine that delivers full cutting power in any position . . . tough, drop forged counterbalanced crankshaft to assure smooth running . . . simple piston pump oiling . . . automatic governor to maintain proper speed . . . large air filter to keep out dust, dirt and snow.

You can put yourself into this money making picture. See and try the new Homelite 7-21 chain saw at your nearest Homelite dealer's store.

*less bar and chain

Full line of attachments: Plunge-cut bar, 14" and 18"; brush cutter; clearing bar.

Straight blade sizes: 14" to 60"



Gear Drive

Only 21 Pounds*

Cuts 20" trees in 18 seconds

Guaranteed for a Full 7 Months

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